Registered at the G.P.O., Sydney, for Transmission by Post as a Newspaper. Published Weekly.

THE

MEDICAL JOURNAL OF AUSTRALIA

(With which "The Australasian Medical Gazette" and "The Australian Medical Journal" are incorporated.)

The Journal of the Australian Branches of the British Medical Association.

VOL. II.—8TH YEAR—NO. 20. SYDNEY: SATURDAY, NOVEMBER 12, 1921. PRICE 1S.

Surgical Instruments

We are pleased to announce that good general stocks of our Surgical Instruments have arrived and that regular supplies are now coming forward. Members of the Profession are cordially invited to visit our Show Rooms.

Allen & Hanburys (Australasia) Ltd.

Instrument Makers to H.M. Army and H.M. Navy

AUSTRALASIAN BRANCH:

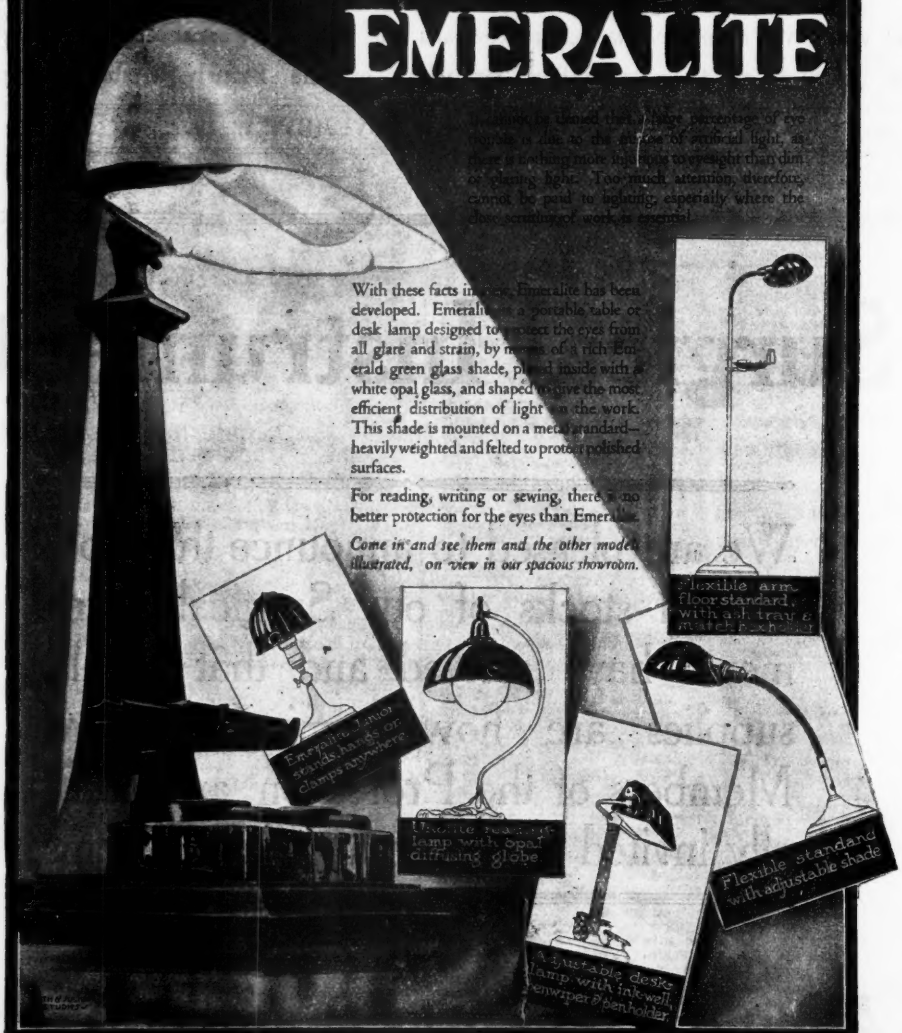
B.M.A. BUILDING : Elizabeth Street, Sydney

Cut out the glare with EMERALITE

With these facts in view, Emeralite has been developed. Emeralite is a portable table or desk lamp designed to protect the eyes from all glare and strain, by means of a rich Emerald green glass shade, pa[illegible] inside with white opal glass, and shaped to give the most efficient distribution of light on the work. This shade is mounted on a metal standard—heavily weighted and felted to protect polished surfaces.

For reading, writing or sewing, there is no better protection for the eyes than Emeralite.

Come in and see them and the other models illustrated, on view in our spacious showroom.


Flexible arm floor standard, with ash tray & match [illegible]
Emeralite table stands, hangs or clamps anywhere
Flexible standard with adjustable shade
Adjustable desk lamp with ink-well penwiper & penholder

Australian General Electric Co

35-45 WENTWORTH AVENUE SYDNEY — MAZDA HOUSE — 116 QUEEN STREET, MELBOURNE

AGENTS:

ADELAIDE, S.A.—Charles Atkins & Co. Ltd., 88-90 Currie Street
BRISBANE, Q.—The Engineering Supply Co. of Australia Ltd. (E.S.C.A.), Corner Edward and Charlotte Streets
PERTH, W.A.—Charles Atkins & Co. (W.A.) Ltd., "Mazda House," 894 Hay Street
TASMANIA—Oliver and Oliver, HOBART and LAUNCESTON
NEW ZEALAND—The National Electrical & Engineering Co. Ltd., AUCKLAND, CHRISTCHURCH, DUNEDIN, WELLINGTON.

THE MEDICAL JOURNAL OF AUSTRALIA

VOL. II.—8TH YEAR. SYDNEY: SATURDAY, NOVEMBER 12, 1921. No. 20.

Table of Contents

PAGE.

ORIGINAL ARTICLES—
Further Observations Upon the Pathogenicity of *Demodex* (Owen) in the Human Being and of Other Parasites Producing Skin Diseases, by Herman Lawrence, M.R.C.P., etc. 419
The Laboratory Diagnosis of Enteric Fever, with Observations on the Agglutination Response to Vaccines, by S. W. Patterson, M.D., B.S., W. W. S. Johnston, M.D., B.S., and Miss F. E. Williams 425
A Preliminary Report on the Treatment of Typhoid Fever with Intravenous Vaccines, by K. Douglas Fairley, M.B., B.S. 428

REPORTS OF CASES—
Two Interesting Cases, by J. J. Woodburn, M.B.. 435

REVIEWS—
Venereal Disease 436
Physiology 436
Dermatology 436

LEADING ARTICLES—
The Third Anniversary 437
In Honour of a Great Man.. 437

THE WEEK—
Adventitious Pulmonary Sounds 438
A Small Plague Epidemic 439

ABSTRACTS FROM CURRENT MEDICAL LITERATURE—
Physiology 440
Biological Chemistry 441

PAGE.

BRITISH MEDICAL ASSOCIATION NEWS—
Scientific 442
Transactions of the Council of the Victorian Branch 442
Nominations and Elections 443
The War Memorial Fund in Victoria 443

PUBLIC HEALTH—
The Plague Outbreak 443

NAVAL AND MILITARY—
Appointments.. 444

THE ANDERSON STUART RESEARCH FELLOWSHIP MEMORIAL 444

OBITUARY—
Peter Johnston Freyer 445
Gordon John Kennedy McIver 445

CORRESPONDENCE—
A Personal Matter 445
W. Watson & Sons, Limited 446

BOOKS RECEIVED 446
MEDICAL APPOINTMENTS 446
MEDICAL APPOINTMENTS VACANT, ETC. 446
MEDICAL APPOINTMENTS: IMPORTANT NOTICE 446
DIARY FOR THE MONTH 446
EDITORIAL NOTICES 446

FURTHER OBSERVATIONS UPON THE PATHOGENICITY OF *DEMODEX* (OWEN) IN THE HUMAN BEING AND OF OTHER PARASITES PRODUCING SKIN DISEASES.[1]

By **Herman Lawrence, M.R.C.P. (Ed.), etc.,**
Honorary Dermatologist, Saint Vincent's Hospital, Melbourne: Consulting Dermatologist, Queen Victoria Hospital, Melbourne.

IN the scrapings of the skin which contain numbers of the *Demodex* I have noticed that there are frequently present numerous cocoon-like objects. When these are carefully examined, the *Demodex* may sometimes be seen emerging from the epithelial coverings. They do not appear to be exfoliated infundibular linings of follicles, as they are definitely cone-shaped and apparently independent epithelial formations.

There are also present worm-like masses of cocoons described by McLeod as occurring in the pilo-sebaceous follicles. These objects break up under the influence of the ether and potash solutions used in the preparation of the specimen.

Many lanugo hairs with epithelial coverings are seen and some of these are difficult to distinguish from epithelial encysted *Demodekes*, especially epithelial encysted hexapod larvæ. There are also present epithelial whorls and some of these appear to contain a nucleus which is difficult to distinguish. In others the remains of disintegrated *Demodekes* can be detected, the cephalo-thorax being evidently the more resistant portion of the parasite. In some granular bodies are found, apparently the same bodies I have found in the disintegration of the contents of the abdomen of the *Demodex*.

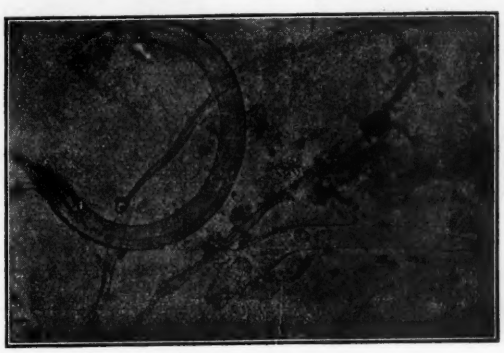


FIGURE I.
Demodex (Hexapod Larva) from Case of *Demodex rosacea*.

When the abdomen of a *Demodex*, in a freshly prepared specimen, is examined, the abdomen is often found to be full of what appears to be fatty substances in the form of

[1] Read at a meeting of the Victorian Branch of the British Medical Association on August 3, 1921.

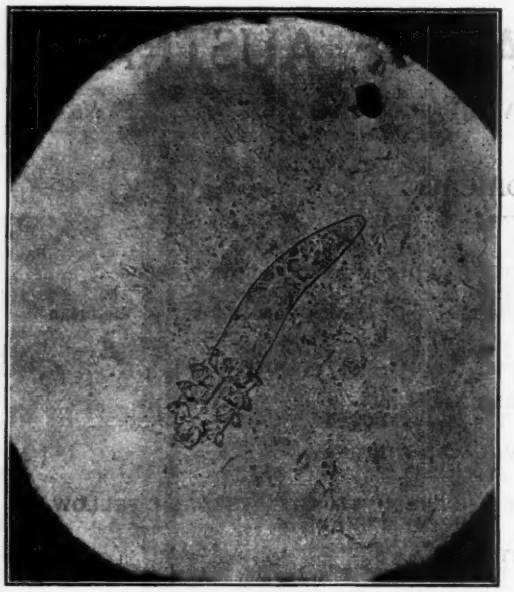


FIGURE II..
Micro-Photograph of *Demodex*, adult; ventral view.

spherical bodies of varying sizes. However, after a time, the abdominal contents appear to divide into separate substances, consisting of opaque masses and certain definite granules or spore-like bodies. These spore-like bodies are about 2 μ in diameter, are somewhat luminous and appear to be too resistant to surrounding influences to be ordinary fatty substances. These are apparently the bodies which occasionally appear as nuclei in the epithelial formations just described.

Borel, quoted by Stelwagon, suggests that the *Demodex* may be a factor in the ætiology of epithelioma of the skin. Darier, writing upon this subject, refers to the finding by Borel of *Demodex* in the early development of epithelioma, suggests that this parasite may act as an irritant or perhaps it carries some hypothetical contagium. I have not had the opportunity of reading Borel's paper upon this subject.

FIGURE III..
Photograph of *Demodex impetigo* (unilateral).

The *Demodex*, though apparently of fragile structure, can, nevertheless, by its worm-like action, burrow into the toughest of skins, as evidenced in the demodectic mange of cattle.

In demodectic or so-called follicular or red mange of the dog the *Demodex canis* is present in large numbers, but it has been shown that the actual cause of the disease is the *Staphylococcus pyogenes albus*. Gmeiner has stated that: "The mite plays an important part in the disease, by preparing the ground for the invasion of the bacterium, by dilating the follicles and probably also carries and introduces the germ." Surely, then, we must look upon the parasite as pathogenic in this matter. In cattle and goats the effects of the *Demodex* upon the skins of these animals is sometimes so destructive that, when they are tanned, holes appear in the skins, due to lesions produced in the skin by these parasites. According to the literature upon this subject, some of these demodectic diseases of animals are practically incurable, owing to the impossibility of getting acaricidal remedies into contact with the parasites, which are too deeply hidden in the skin to permit of a therapeutical success being obtained in this manner. The destruction of valuable animals is recommended in order to prevent the spread of disease to other animals.

FIGURE IV..
Acarus (?) C, found in Sarcoptic Mange of Cat, resembling *Acarus* (?) B.

In my experiments in connexion with the effects

FIGURE V..
Micro-Photograph of *Dermanyssus*, about the size of a young *Pediculus corporis*. It usually gets away from the patient in the early morning.

of radiations of radium and X-rays upon the metamorphosis of insect life, read at the Australian Science Congress, held at Melbourne in January, 1921, I showed that, working with the *Bombyx mori*, the ova and young larvæ may be easily destroyed by radium radiations (medium to hard β rays predominating), that is to say, well within the range of practical therapeutical dosage, and that, as the larvæ develope and so become more difficult to destroy by justifiable therapeutical dosage, as likewise when they become chrysalides or moths, these radium radiations in therapeutical doses can still prevent reproduction of species, by producing sterilization of the insects. This effect is produced in the grub, chrysalide, or moth, irrespective of sex (see Figure XIII.).

From Hirst's description of the generative organs in this genus, *Demodex*, it would appear that similar effects could be obtained in the treatment of this parasite as first mentioned in the case of the *Bombyx mori*. As the parasite is situated well within the range of the therapeutical action of these radiations, the treatment by this method of actual destruction or prevention of reproduction by sterilization should be successful in the treatment of these cases. I have used this method of treatment with apparent success in the treatment of that form of rosacea I have termed demodectic rosacea or rosacea in which *Demodekes* are present in large numbers and, by dilating the follicles and at the same time carrying pyogenic organisms into the deeper parts of the follicle, help to keep up an obstinate folliculitis of the part. Some of the *Demodekes* are placed head downwards deeply in the follicles; acaricidal remedies, therefore, cannot readily reach them.

FIGURE VI..

Micro-Photograph of *Acarus* (?) B, found in a case resembling scabies. The legs have been damaged in the removal from the patient.

Dermanyssus avium et gallinæ.

I have found this parasite producing a skin disease on many occasions. When in Paris (see Figure V.) in 1907 I took one of these parasites to Dr. Sabouraud, in order to obtain his opinion upon it, as, at that time, its connexion with skin troubles in the human being was not well known. Dr. McLeod gives a very good illustration of this parasite in his book on dermatology just to hand. As the detection of these cases due to the *Dermanyssus* is not always an easy matter, I will describe one or two of my cases.

An old lady attending at the Skin Department of the Melbourne Hospital, complained of severe pruritus of her skin, which troubled her particularly at night-time. On examination I found no evidence of scabies or pediculi. There was no evidence of eczema or such like inflammatory disease of the skin. I then remarked to the students who were present that, under the circumstances, we would have to look upon the case as one of pruritus, but, at the same time, I said I rather suspected a parasite called the *Dermanyssus*. I made a mark upon a piece of paper to show how very minute the parasite was. In a few minutes' time the nurse in attendance, who had listened to my description of the parasite, brought in one of the old lady's stockings and drew my attention to something she had found on it. This I placed under the microscope and found it to be a *Dermanyssus*. As the parasites, like bugs, attack the patient at night-time and make tracks in the early morning, it may be difficult to find any on the patients when they seek your advice.

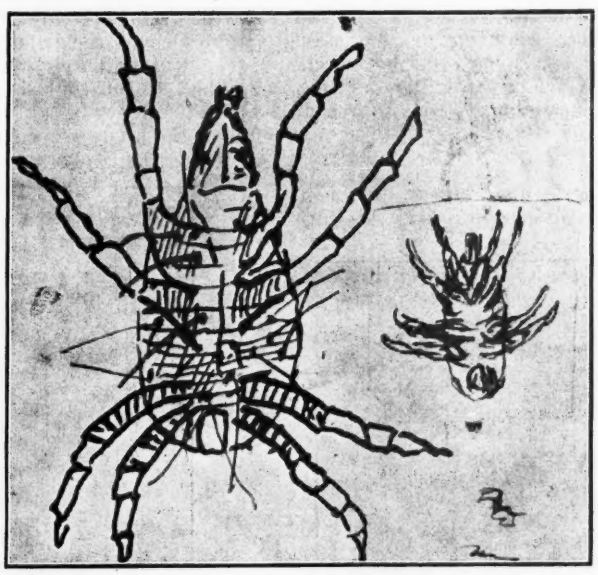


FIGURE VII..

Acarus (?) A. Microscopical drawing of *acari* as seen under different degrees of magnification.

Dr. Norman McArthur has kindly given me the following account of a patient I saw in consultation with him some years ago. The patient was troubled with pruritus which affected him chiefly at night-time. He had to go to Sydney for a few days and during his absence from Melbourne the pruritus practically disappeared. On returning to Melbourne, the pruritus at night-time was worse than ever. I suggested the possibility of the *Dermanyssus* and advised a search for starlings' nests about the house. A starlings' nest was found under

the roof of the house and the trail of the insects was traced to the bath-room window and from there to the bath. The bath sponge was found to be alive with these parasites. I remember the patient brought me quite a number of them in a small bottle. The accompanying micro-photograph (see Figure V.) was taken of one of these parasites. I have examined starlings for these parasites, but could not find any, although the birds had numerous pediculi on them, especially at the back of the neck. The parasite has eight legs and belongs to the order *Arachnidæ*. It is about 0.75 mm. in length and, when seen on the patient's clothes, looks very like a young *Pediculus vestimenti*, for which it is probably mistaken and thus gets overlooked.

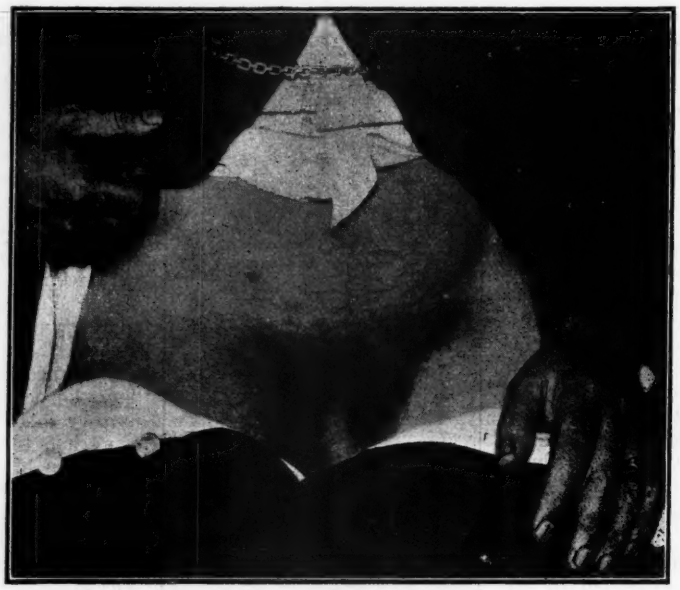


FIGURE VIII..

Photograph of a Patient with a Papular Eruption in the Pubic Region, due to *Acarus* (?) A. The disease is supposed to have been contracted at Colon, Panama Canal.

Mr. G. A. Syme asked me to see two ladies who were troubled with great irritation of the skin. Mr. Syme had already got specimens of the insects under the microscope, which I recognized as *Dermanyssus*. In this case we thought the source of the trouble was from a goose farm.

An Acarus (?) A.

An engineer belonging to an overseas boat consulted me about a lichenoid eruption upon his face and neck, which had become pustular. He had also a severe pruritic eruption of the hairs in the pubic region. The latter eruption was papular, the papules being of considerable size. I suspected syphilis as the cause of his skin trouble on the face, which proved to be correct. His serum gave a Wassermann reaction and the cutaneous manifestations disappeared quickly with mercurial treatment. The eruption in the pubic area puzzled me somewhat. It did not fit in with *pediculosis pubis* or scabies. On examination of the papules by curetting them somewhat deeply I found the cause of each papule was a parasite. The parasite was different to any I had found in skin troubles previously. It had eight legs and so belonged to the same order as the *Acarus scabei*, but its shape was quite different. Its shape was like the *Tyroglyphus longior*, which is the parasite found in copra itch. But the copra itch parasite does not burrow and the size of this one (0.3 mm.) was much smaller than that of the copra itch parasite. Pruritus in this case was very severe. The condition soon cleared up with sulphur ointment, but, as a matter of fact, I think the severe curetting of the papules cured the trouble, by removal of the parasites. Unfortunately, the specimens were not photographed at the time, but both Dr. Colquhoun and I made drawings of them, as they appeared under the microscope; one drawing is under the

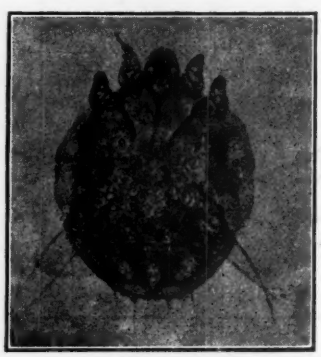


FIGURE IX..

Micro-Photograph of *Acarus scabiei*, female, from a case of scabies in a human being. Note the different shape of the body as compared with *Acarus* A and B.

FIGURE X..

Micro-Photograph of *Acarus scabiei*, male, from a case of sarcoptic mange of a cat. Note the position of the posterior legs in this parasite, as compared with that of Figure IX..

low power and the other under a higher power. It may be seen that the shape of the parasite and length of the legs, etc., is quite different to the *Acarus scabiei*. (See Figures VII. and VIII..)

An Acarus (?) B.

This parasite is very similar to the one just described, but I do not think that it is the same.

A baby, the child of full-blooded Chinese parents, was brought to me for a markedly pruritic eruption of the feet and hands. There was also a scaly eczematous patch upon the forehead. Scrapings of the eczematous patch failed to reveal any parasites. On the feet were several vesicles containing clear fluid, about half the size of split peas. There were no papulo-pustules, as generally occur in scabies. I pricked one of the vesicles with a bistoury and deeply scraped the exuding surface; in this scraping the microscope showed the presence of a parasite as depicted in the accompanying micro-photograph (see Figure VI.).

It has eight legs and therefore belongs to the *Arachnidæ*. The shape of its head and body are very similar to the parasite just described, as are the somewhat long, many-jointed legs. It is obviously a distinct parasite to the *Acarus scabiei*.

I have not, up to the present, been able to satisfy myself as to the exact classification of these two parasites, but they are somewhat similar to the micro-photograph depicted in the last edition of Castellani and Chamber's book of the *Rhizoglyphus parasiticus* Dalgetty, which is said to cause trouble in the feet of Indian coolies. This parasite lives upon plants. Castellani does not give the measurements of this parasite. The *Pediculoides venticosus* Newport appears to be longer in the body and of a more oval shape than this parasite.

FIGURE XI..
Micro-Photograph of a Carabid (*Carabidæ*) Hexapod, insectivorous insect.

FIGURE XII..
Photograph of a Patient with Lesions of the Skin (unilateral), obviously the result of bites, supposedly of a carabid.

Acarus Scabiei of the Cat (Sarcoptic Mange).

On my way to Saint Vincent's Hospital one afternoon I came across a cat with what appeared to me to be a rather uncommon disease of the skin. Thinking the cat might have demodectic mange and that I might be able to obtain some specimens of the *Demodex felicis* for experimental purposes, I obtained some scrapings from the cat's skin. The appearance of the skin trouble on the cat was that of an accumulation of dry crusts upon the ears, head and face, without any marked indications of dermatitis. The condition did not suggest eczema, ringworm or the cusps of favus. Under the microscope I found numerous parasites, *Acari scabiei*. They were very similar in appearance to the *Acarus scabiei* of man, but only about half the size. (See Figures IX. and X..)

A few days later I came across a kitten with a similar disease, from which I obtained specimens for the microscope and found the same presence of acari in large numbers (see Figure IV.).

The appearance of this parasite under the microscope reminded me of an *Acarus scabiei* I had obtained from one or two cases of scabies in the human being some years ago. These patients had the symptoms of scabies, but I could not find any burrows and it was only with extensive examinations of scrapings in these cases that I was able to obtain any parasites. And then the acari I obtained were in all instances very small ones. In the light of my cat experience, I am inclined to believe that these irregular cases of scabies, which had puzzled me, may have been cat scabies contracted by the human being. Literature has shown that this can take place and that in these cases

there are no burrows. Of course, I have seen many patients with scabies in whom I could not find burrows, owing to cleanliness, but the patients I refer to were in such a condition that I would expect to be able to find the usual conditions of scabies. It would be interesting to know to what extent this disease exists amongst the cats in Melbourne. The ones I examined were otherwise quite healthy and they were quite tame and, no doubt, house cats being freely fondled by children.

A Carab (Carabidæ) Hexapoda.

Mr. French, Government Entomologist, who kindly classified this insect for me, tells me that the carab is an insect-eating insect, but does not generally cause much trouble to man. Lighting upon his neck, it may bite him and he brushes it away and there are no further symptoms (see Figure XI.). In the case I am mentioning, a man consulted me with a dozen or more papules in the region of his right axilla. They were obviously the results of bites. The condition was unilateral; there were no subjective symptoms and I think his chief trouble was that he could not account for the condition. Bugs and fleas, he said, were impossible in his case. I persuaded him to make a thorough search of his pyjamas and bed clothes for insects. The result was three insects, one of which is shown in the accompanying photograph. He thought they might have come from sun-flowers, which were growing in numbers just outside of his bedroom window. He brought me in numbers of insects he obtained from the flowers and, amongst them, this same carab was easily identified. Of course, in this case the finding of the carab as described may only be a coincidence, but it is very suggestive of this insect being the cause of his trouble (see Figure XII.).

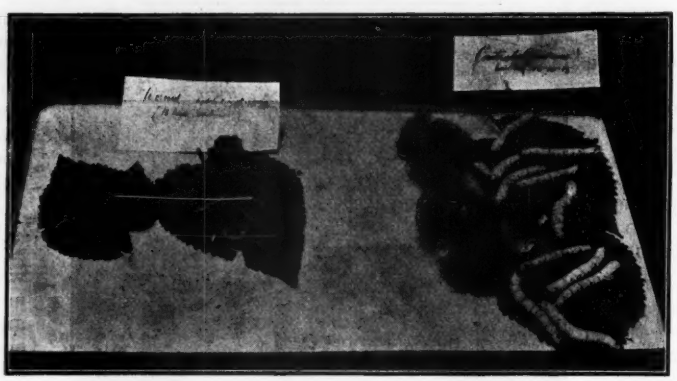


FIGURE XIII..

Experiment upon *Bombyx mori*, showing inhibition of growth; the small grubs are one week older than the larger or control grubs. By arranging the dosage of radium rays, the life of the grubs may be prolonged 30% beyond the natural life. Many grubs become pupæ or chrysalides without spinning, the secretory gland being destroyed. If irradiated grubs with prolonged life become moths, the eggs will not be fertilized, even if they are mated with normal moths. Control grubs of experiment on the right side.

Taches Bleuâtres (Maculæ Cæruleæ); Non-Parasitic.

In Darier's text-book of dermatology (1921) he states: "A peculiar consequence of the bite of *Pediculus pubis* is the appearance of blue spots (*taches bleuâtres* or *maculæ cæruleæ*), seen especially on the abdomen, the flanks and the thighs. Formerly regarded as symptomatic of undetermined or even of typhoid fever, these spots have been traced to their true cause by Falot and the experiments of Duguet." This is the position taken up by dermatologists to-day. Duguet's experiment consisted in the mincing up of some *Pediculi pubis* and injecting some of the fluid into the skin, with the result that blue spots were produced and were indistinguishable from the blue spots seen in cases of persons infested by this parasite.

What I contend is that Duguet's experiments do not disprove that similar blue spots cannot appear in the skin, irrespective of the presence of these parasites. Dr. A. V. M. Anderson, of Melbourne, wrote a short paper upon this subject some twenty years ago, describing the occurrence of *taches bleuâtres* in some cases of typhoid fever. I consider his observations were correct and that the spots were not due to an overlooked presence of *Pediculi pubis*.

In 1917 I contributed a paper to THE MEDICAL JOURNAL OF AUSTRALIA upon this subject, contending that *taches bleuâtres* could occur in two forms, parasitic and non-parasitic. I had had several soldiers with *taches bleuâtres* who certainly had not got any evidence of *Pediculi pubis*, but swabs from the throat proved that they were suffering from cerebro-spinal meningitis. Since that date I have paid particular attention to this matter, especially as regards the *taches bleuâtres* occurring in cases of *Pediculosis pubis*.

I would say that I can see no difference as far as the colour and appearance of these spots are concerned in the parasitic and non-parasitic conditions. But clinically there is much difference, for when the hairs are shaven from the parts affected and the parasites destroyed the *taches bleuâtres* will disappear in a few days time. But in the case of a non-parasitic *taches bleuâtres* it often takes weeks for the macules to clear up.

Taches bleuâtres always occur in close proximity to the parts affected by the parasites, for instance, if one axilla alone is affected, the *taches bleuâtres* will appear only in the skin adjacent to that part; in that case the condition is unilateral. Non-parasitic *taches bleuâtres* are generally bilateral and more or less symmetrical.

Addendum.

Dr. Keith Colquhoun has kindly made out the following measurements for me of the parasites mentioned in this paper: *Demodex*, 250 μ to 350 μ; *Demodex* (larva), 300 μ to 400 μ; *Acarus* (?) A,

not measured, but probably about 250 μ; *Acarus* (?) B, 200 μ; *Acarus* (?) C, 200 μ; *Acarus scabiei* (human), female, 300 μ; *Acarus scabiei* (cat), male, 150 μ; *Dermanyssus*, 750 μ.

I wish to thank Mr. Clinton for the excellent micro-photographs he has produced of these parasites.

THE LABORATORY DIAGNOSIS OF ENTERIC FEVER, WITH OBSERVATIONS ON THE AGGLUTINATION RESPONSE TO VACCINES.[1]

By **S. W. Patterson, M.D., B.S. (Melb.),**
W. W. S. Johnston, M.D., B.S. (Melb.),
and
Miss F. E. Williams.

(From the Walter and Eliza Hall Research Institute, Melbourne.)

PART I.

THE stimulus to the attempts to make a correct diagnosis of the enteric infections during the recent war arose from two sources, the efforts of the army authorities to reduce these diseases, which had been a cause of enormous wastage of troops in previous campaigns, and the fact that a gigantic experiment was being carried out on the efficacy of prophylactic inoculation with typhoid vaccines. Laboratory aids were a necessary and valuable help in the diagnosis of enteric diseases. To this end laboratory methods were improved and became almost standardized later on. We have applied these methods in the cases of typhoid fever and suspected typhoid fever in the Melbourne Hospital in the autumn of 1920 and the summer and autumn of 1921. The following remarks may, we hope, be of use to practitioners in letting them know what help they may expect from laboratory results and in offering them a guide to the proper interpretation of laboratory reports.

For the methods adopted workers are referred to the full details contained in the Medical Research Council's Report.[1] We have followed these methods, with modifications only in non-essential matters.

Cultures of the causal micro-organisms from the blood, fæces and urine and the immunity response of the patient, especially the agglutinogenic capacity of the blood (Widal), are the means used by laboratory workers. We have put together in the following diagram the results obtained in our routine laboratory examinations of the patients suffering from typhoid fever.

For our series we have investigated 130 cases, of which 66 were proved to be enteric fever. The statistics of the Registrars of the Melbourne Hospital show that 89 patients with enteric fever were admitted during the years July, 1919, to June, 1921, with ten deaths—a case mortality of 11%.

The chart (see Figure I.) shows the percentage of positive findings obtained in each week of the disease and therefore the likelihood of being able to make a positive diagnosis from any method of examination at any one time.

Blood Culture.

During the early stages of typhoid fever there is a typhoid septicæmia; we grew the typhoid bacillus from the blood in 100% of the patients examined during the first week of illness. Later the chances rapidly become less and after the third week blood cultures should not be expected to yield a positive diagnosis.

Examination of the Fæces.

In the first two weeks cultures from the fæces are obtained in a large proportion of cases, but later

[1] Read at a meeting of the Section of Preventive Medicine of the Victorian Branch of the British Medical Association on August 3, 1921.

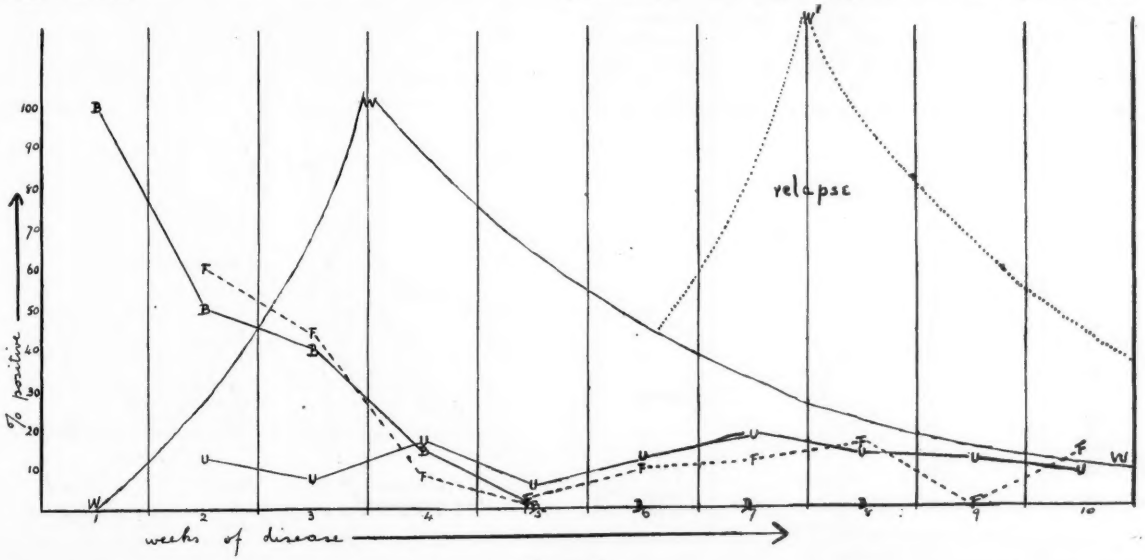


FIGURE I.
Percentage of Cultures of *Bacillus typhosus* from Blood (B), Fæces (F) and Urine (U) in Each Week of the Disease. The course of the typical Widal reaction curve is shown (W).

successful results become diminishingly frequent. The bacilli reappear in the fæces during a relapse or in the very late stages when possible carriers may be caught.

Urinary Cultures.

The endeavour to grow bacilli from the urine is not nearly so valuable as a means of diagnosis; it may succeed quite late—the "carrier" period.

Widal Reaction.

We have carried out the Widal test by a macroscopic method. The serum is diluted with distilled water in series in rows of small test tubes; equal quantities of diluted serum and a formalinized emulsion of a culture of *Bacillus typhosus* are mixed. The tubes are placed in a water bath at 55° C. for two hours, allowed to cool on the bench and read. The end point is taken as the tube containing the smallest amount of serum which causes a uniform flocculation visible to the naked eye throughout the tube.

Agglutinating Power of the Blood.

Observations on the agglutinating power of the blood, taken as the reciprocal of the dilution of serum giving the end point of agglutination, were carried out at intervals throughout the disease. Very variable maxima in actual figures were found in different cases; but when the results are charted in terms of the percentage of the maximum in the first four weeks of the disease, a considerable uniformity appears to emerge in the time at which the maximum occurs (see Figure II.).

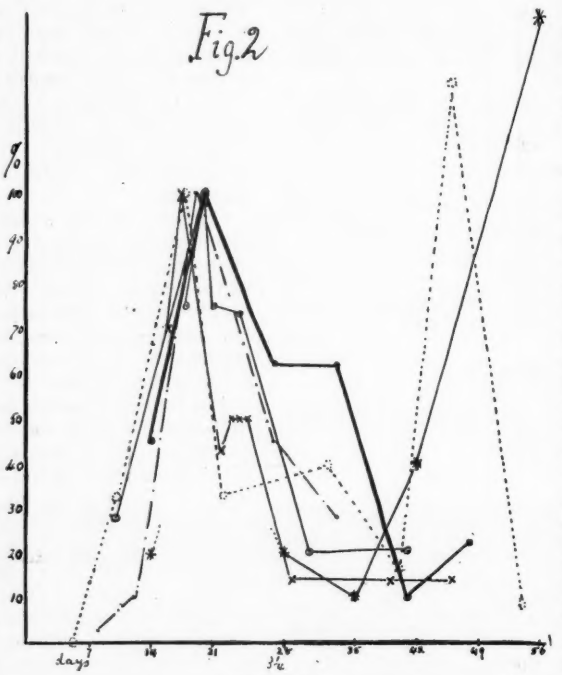


FIGURE II..
Widal Reaction of Six Cases of Typhoid Fever, quantitatively estimated and plotted as percentages of the maximum observed during the first four weeks.

The curve so charted commences from zero during the first week, rises rapidly to reach a maximum about the end of the third week and subsides more slowly, to be interrupted by a further rise in the sixth to ninth weeks, should a relapse take place. Thus, cases which first come under observation in the third or fourth week of the disease, when the chances are against successful isolation of the bacillus from the blood or fæces, may be diagnosed by successive determinations of the agglutinin titre of the patient's serum when quantitative methods are used. This is, of course, not new, as it was pointed out by Dreyer and Ainslie Walker,[2] who further showed that previous inoculation of the patient with typhoid-paratyphoid A and B vaccine did not essentially modify the shape of the "agglutinin curve," but merely started it from a higher base line, as it were. As the method of quantitative determination of the Widal reaction is, however, not in gen-

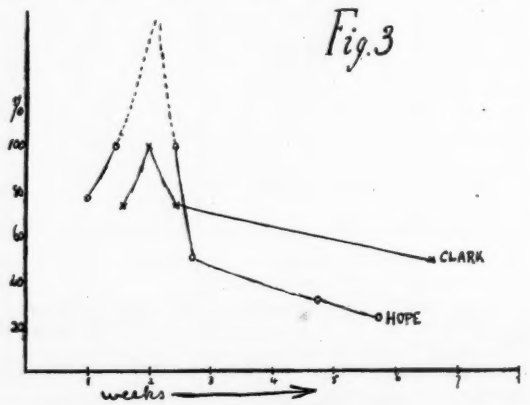


FIGURE III..
Widal Reaction to *Bacillus paratyphosus B* in two cases. There was no agglutination to *Bacillus typhosus* or *Bacillus paratyphosus A*. Plotted in percentages of maximum.

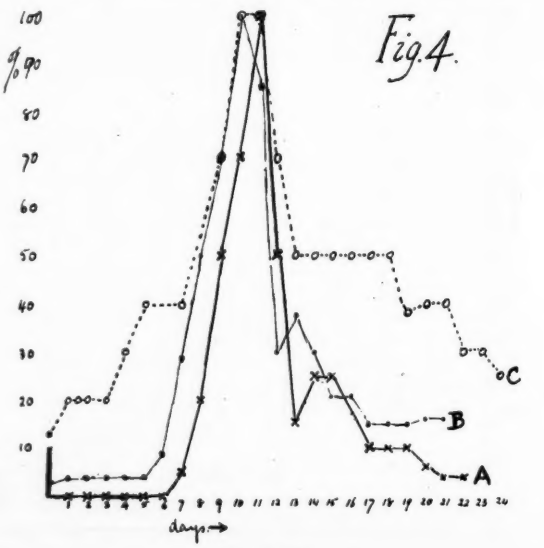


FIGURE IV..
Widal Reaction to Subcutaneous Injection of Typhoid Vaccine (see text). Plotted in percentages of maximum.

eral use in Australia and as we have found these observations of use in the diagnosis of several patients with pyrexia of uncertain nature in our series, we wish to emphasize the value of these considerations of the shape of the curve.

We have always put up a series of dilutions of serum, each with emulsions of *Bacillus paratyphosus A* and *Bacillus paratyphosus B*, at the same time as with *Bacillus typhosus*. In two patients from whom we were unsuccessful in isolating any "enteric group" organism from the blood or fæces, we obtained curves of agglutination to *Bacillus paratyphosus B* only. These curves (see Figure III.) are so shaped that we are, we think, justified in concluding that these patients were suffering from a *Bacillus paratyphosus B* infection. It is possible that a number of cases of paratyphoid B fever may occur during the summer months and, running a course often quite different from that of the classical typhoid fever, may remain unrecognized.

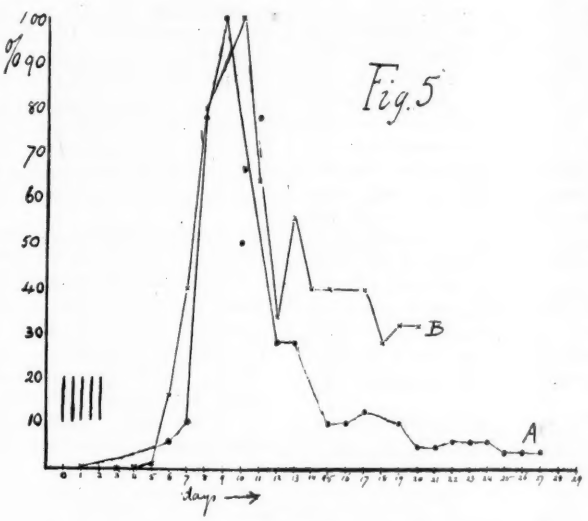


FIGURE V..
Widal Response to Intravenous Typhoid Vaccine (see text). Plotted in percentages of maximum.

Co-agglutination.

In five cases (three in the initial fever and two in the relapse period) there was agglutination to *Bacillus paratyphosus A*, as well as to *Bacillus typhosus*; in four cases (one in the initial febrile and three in the relapse period) there was agglutination to *Bacillus paratyphosus B*, as well as to *Bacillus typhosus*, while in one patient (uninoculated previously) the serum showed agglutination to all three bacilli throughout the course of the illness.

Carriers.

Three patients were still excreting typhoid bacilli in the urine and one patient in the fæces, although clinically they had recovered and were fit for discharge. From one patient the gall-bladder, drained at operation, yielded a pure culture of typhoid bacilli fifteen years after an attack of typhoid fever.

Summary.

1. In the laboratory diagnosis of typhoid fever, blood cultures are of great value in the first two or three weeks. In the first week cultures of *Bacillus typhosus* may be obtained in 100% of cases. In all cases of pyrexia of uncertain origin blood cultures should be made as soon as the patients come under observation.

2. Cultures from the fæces may be obtained during the first three weeks in a considerable proportion of cases.

3. The routine culturing of the urine yields a small proportion of positive results, but often a positive result may be obtained from the urine culture alone.

4. A positive diagnosis may be made by successive quantitative estimations of the agglutinating power of the serum, which shows a maximum about the end of the third week.

5. All patients with typhoid fever should be examined during convalescence for the "carrier" state.

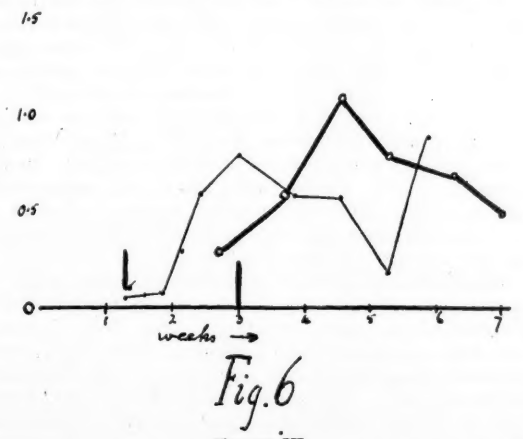


FIGURE VI..
Curves After One Intravenous Injection of Vaccine during the Course of Typhoid Fever. Logarithms of agglutinin titre.

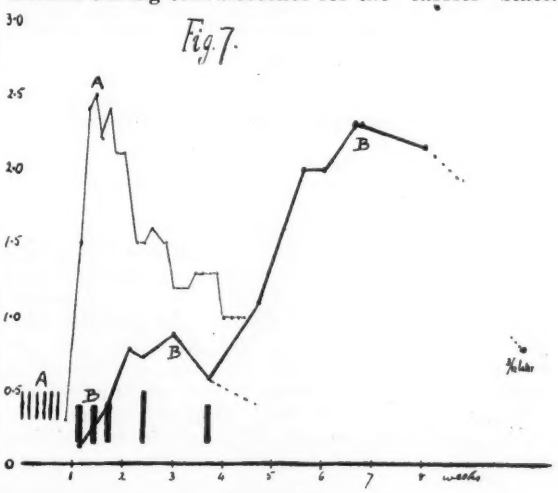


FIGURE VII..
See Text. Scale: Logarithms of agglutinin titre.

PART II..

During the year we have had opportunities of watching the typhosus agglutinin response in the blood under varying conditions. In Figure IV. the response in healthy persons to one subcutaneous dose of 250 millions of *Bacillus typhosus* vaccine is shown. After an interval of four to six days the curve rises sharply, to reach a maximum on the tenth day and then declines, rapidly at first, more slowly later. Curve A is that of a man who had had neither typhoid fever nor previous inoculation; Curve B is that of a man who had had typhoid fever twelve years ago and no previous inoculation; Curve C is that of a man who had had many previous inoculations. The curves are identical at their maxima, but in the subjects of Curves B and C there were some residual agglutinins in the serum before inoculation.

In Figure V. we have the response of two patients not suffering from enteric fever, who had an intravenous injection of *Bacillus typhosus* vaccine as "non-specific protein therapy." The numerical value of the highest agglutinin titre is much greater than after subcutaneous injection (*e.g.*, "A," Figure V., titre 1:30,000; "A," Figure IV., titre 1:1,600), but the shape of the curve is similar and the maximum occurred about the tenth day.

In patients suffering from typhoid fever, one intravenous injection of typhoid vaccine also produced a wave with its maximum on the tenth day after inoculation (see Figure VI.).

Figure VII. shows the agglutinin titre plotted to scale of two patients. One had several successive intravenous doses of typhoid vaccine as treatment for asthma (A); the maximum response is reached on the tenth day. The second had several doses during an attack of typhoid fever (B). The response is prolonged and shows no distinct spike in the curve.

In the response to the natural infection during the course of typhoid fever there is a distinct wave, with its maximum about the seventeenth to twenty-first day (see Figure II.).

References.

(1) Medical Research Council, Special Report, No. 51, 1920.
(2) Dreyer, Ainsley Walker and Gibson: *Lancet*, February 13, 1915, page 324.

A PRELIMINARY REPORT ON THE TREATMENT OF TYPHOID FEVER WITH INTRAVENOUS VACCINES.[1]

By K. Douglas Fairley, M.B., B.S.,
Medical Registrar, Melbourne Hospital.

Introduction.

TYPHOID fever in Victoria is a disease with a high mortality rate. Despite modern advances in diagnosis and appropriate treatment by such measures as hydrotherapy, careful dietary and nursing, there yet remains great scope for improvement. An analysis of the Melbourne Hospital records of the past thirteen years shows that nine hundred and fifty-two patients have been admitted to the wards in this period on account of typhoid fever. Of these patients, one hundred and twenty-five have died—a mortality rate of 13.1%. These figures indicate the necessity for careful study of any additional therapeutic measures likely to be of value in combating this disease. From this point of view, I have undertaken a critical investigation of a number of patients with typhoid fever treated by intravenous injections of vaccines.

The results obtained are incorporated in the following preliminary report.

The Clinical Results of Vaccines Applied Intravenously in Typhoid Fever.

Ichikawa[1] first employed *Bacillus typhosus* vaccines intravenously as a therapeutic measure in Japan in 1912. In 1914 he published a full report of eighty-two patients treated with sensitized vaccines. Fifty *per centum* of these patients were cured by crisis. Shortly after this, Kraus[2] and his colleagues, working independently, published their reports, showing results similar to those of Ichikawa.

Since then the method has been tested by Gay[3] in America and by various observers in Europe. In all the recorded cases the mortality rate has been less than in the control series of typhoid fever cases treated only with the usual methods.

My series consists of fifteen patients suffering from typhoid fever admitted to the Melbourne Hospital between the months of February and June, 1921. Eight patients were treated with vaccines given intravenously; the remaining seven were not so treated and therefore serve as a control series.

Table I. shows a statistical comparison of the two series:

TABLE I.—A COMPARISON OF THE TREATED AND UNTREATED SERIES.

Average.	Age. Years.	Day of Disease on Admission.	Febrile Period After Admission Days.	Total Febrile Period. Days.	Mortality Rate.
Treated Series	21	9th	16.25	25.25	Nil
Untreated Series	27	10th	27	37	14.3%

It should be noted that the age of the untreated patients was slightly higher than that of the treated. This was purely accidental, as the cases were quite unselected. The average total febrile period is shortened by 10.75 days in the treated series.

Table II. gives a more detailed analysis of the treated cases and shows that 50% of the treated cases and one relapse were aborted by crisis. In the remaining 50%, the pyrexial chart was apparently not modified. But in this group, quite as much as in the aborted cases, the change in the clinical picture of the patient was remarkable.

Whether the grades of infection were mild or severe, the diminution in the toxic features was characteristic and striking. The dull, listless, apathetic patient of the second or third week, with anorexia, heavily furred, dry tongue and distended abdomen, was converted within forty-eight hours into a bright, mentally alert, hungry individual. The tongue became moist and clean, the distension of the abdomen disappeared and the medical and

[1] Read at a meeting of the Section of Preventive Medicine of the Victorian Branch of the British Medical Association on August 3, 1921.

nursing staffs were constantly being worried with requests for food and permission to be allowed out of bed. Indeed, this obliteration of the toxæmic features of typhoid fever constitutes the most remarkable clinical change in these patients, superseding even the dramatic critical fall of temperature.

TABLE II.—DETAILED DATA REGARDING THE TREATED CASES.

Case.	Days of Injection of Vaccine.	Dosage in Millions, *Bacillus typhosus*.	Days Febrile After First Vaccine.	Total Febrile Period.	Maximum Temperature Reaction.
I.	9th	200	0	9	40.5° C.
II.	12th	250	0	12	40.5° C.
III.	8th	200	1	9	40.6° C.
	9th	200			40.5° C.
	14th	200		Cellulitis	40.3° C.
	16th	200		28 days	40.5° C.
IV.	11th	250	4	15	40.8° C.
	12th	75			40.8° C.
	14th	250			40.0° C.
	15th	250			40.5° C.
	28th	250	0, Relapse	6, Relapse	40.6° C.
V.	11th	250	28	39	41.3° C.
	13th	250			41.3° C.
	17th	250			41.3° C.
	23rd	250			41.1° C.
	25th	250			40.5° C.
VI.	15th	275	24	39	42.0° C.
	17th	150			40.3° C.
	18th	175			40.4° C.
	19th	150			40.9° C.
	20th	150			40.7° C.
	22nd	150			41.6° C.
	28th	150			41.5° C.
VII.	10th	200	26	36	41.3° C.
	12th	200			41.4° C.
	16th	200			41.6° C.
	20th	125			41.3° C.
	22nd	75			41.6° C.
VIII.	11th	200	32	43	41.1° C.
	13th	200			40.2° C.
	15th	200			40.0° C.
	20th	300			40.8° C.
	29th	200			40.8° C.

The patients of Case II. and Case VI. received a vaccine of *Bacillus typhosus* only; the remainder received a stock vaccine of *Bacillus typhosus* and *Bacilli paratyphosi A et B*. In this table the dosage of *Bacilli paratyphosi A et B* is omitted.

The effect of intravenous vaccine therapy may be studied on the accompanying temperature charts.

The chart of Case I. shows the typical cure by crisis after one injection of vaccine, the temperature thereafter not rising above normal.

The chart of Case IV. shows cure by crisis after the fourth injection. A week later there was a mild relapse. This was cured by crisis after one more injection.

The chart of Case VII. shows a case in which the pyrexial course was not modified to any extent by vaccine treatment.

The Complications Met With in the Treated Series.

The following complications—hæmorrhage, pyelitis and cellulitis—occurred in the series of treated cases. In Case VIII., the pyelitis persisted until hexamine (0.6 gramme thrice daily) was given.

Hæmorrhage occurred in two cases; in Case III. it was slight, but in Case VI. it was more severe.

The most serious complication was observed in Case III., where, after three days' apyrexia resulting from vaccine treatment, there developed a severe cellulitis of the face, orbit and scalp, the infecting organism being *Staphylococcus aureus*.

The patient of Case IV. had a mild relapse, which was cured by crisis after one further injection of vaccine.

The patient of Case V. was discharged from hospital with *Bacillus typhosus* still present in the fæces. This was exceptional, as vaccine therapy usually increased the difficulty of isolating *Bacillus typhosus* from the dejecta.

In the untreated control series, intestinal hæmorrhage occurred in two patients, pyelitis in one and pneumonia in another. One patient suffered from a relapse after sixteen days.

In this limited series of cases, vaccine therapy does not appear to have altered the incidence of complications.

In a larger series, however, this result would probably be observed.

The Treated Series.

CASE I.—A.H., male, aged 17 years, was admitted to hospital with a typical picture of typhoid fever. There was a history of anorexia, headache, lassitude, epistaxis and constipation. The temperature was 38.3° C. and the pulse-rate 72 per minute (relative bradycardia). Examination of the abdomen showed distension, tenderness, rose spots and a palpable spleen. A Widal reaction was obtained in a dilution of 1: 60.

The patient had taken to bed seven days before. Two days after admission the patient received an intravenous injection of vaccine, the dose being 200 millions of *Bacillus typhosus* and 100 millions each of *Bacilli paratyphosi A et B*. Following this injection, the temperature rose to 40.5° C.; it then fell by crisis and within thirty-six hours it registered 35.6° C.. Thereafter it did not rise above normal. Convalescence was uninterrupted. On the fourth and sixth days after the vaccine was given, tissue paper sloughs were present in the stool.

CASE II.—H.G., female, aged 17 years, was admitted to hospital, having been ill for five days. No Widal reaction was obtained and the clinical diagnosis at this stage was doubtful. On the ninth day a Widal reaction was obtained in a dilution of 1: 160 and the complement fixation test yielded a reaction (P ++) on the twelfth day of illness. On this day one intravenous injection of vaccine was given, the dosage being 200 millions of *Bacillus typhosus*. The temperature, which for the previous thirty-six hours had varied between 36.7° C. and 37.8° C., rose to 40.5° C. and then fell by crisis within the next thirty hours. Thereafter it remained subnormal and convalescence was uninterrupted.

CASE III.—J.L., male, aged 24 years, was admitted to hospital with the typical history and clinical picture of a severe case of typhoid fever. A Widal reaction was given in a dilution of 1: 640. Pallor of the face was so marked that an enema was given at once, to see whether there

had been any hæmorrhage into the bowel. The patient had taken to bed eight days before.

On the day of admission and also on the following day (*i.e.*, the eighth and ninth days of the disease) the patient was given an intravenous vaccine of 200 millions of *Bacillus typhosus*, with 100 millions each of *Bacilli paratyphosi A et B*. There was the usual rise and fall of temperature following these injections and for the next three days the patient was quite afebrile and without any toxic symptoms. On the thirteenth day the temperature commenced to swing above normal and a typical septic type of temperature prevailed for twenty-eight days. This temperature was quite uninfluenced by two vaccines similar to those given before. These further injections were administered on the fourteenth and sixteenth days of the disease. This septic type of temperature was due to a virulent staphylococcal cellulitis of the face, orbit and scalp, commencing originally from some abrasions about the nose.

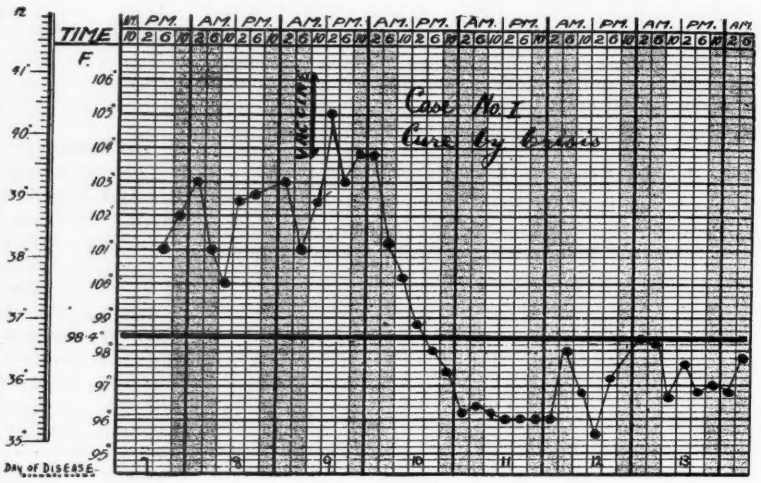


FIGURE II..

On the twenty-first day the patient received ninety cubic centimetres of antistreptococcal serum intravenously, the condition at this time being regarded as streptococcal in origin. Twelve hours after this there was a slight hæmorrhage *per rectum*. On the twenty-fourth day, under a general anæsthetic, the orbital and scalp tissues were incised, but very little pus was found. Cultures showed the infecting agent to be *Staphylococcus aureus*.

The patient ultimately recovered, but, unfortunately, the sight in the right eye was lost.

CASE IV.—B.M., male, aged 18 years, on admission to hospital gave a history of having taken to bed seven days before, on account of increasing lassitude and weakness, headache, anorexia, abdominal pain and slight diarrhœa.

On examination, it was seen that the lips were cracked, dry and sore; the tongue was dry, with a brownish white fur, while a profuse roseolar eruption covered the abdomen and thorax. The edge of the spleen was palpable. A Widal reaction was obtained in a dilution of 1: 160 to *Bacillus typhosus*; 1: 2,400 to *Bacillus paratyphosus B*. Unfortunately, at no stage of the disease was the infecting organism isolated and, after intravenous injections (on four occasions within five days) with a vaccine of 250 millions of *Bacillus typhosus* and 125 millions each of *Bacilli paratyphosi A et B* the patient became afebrile for seven days.

In the course of the succeeding six days, there was a mild relapse, the temperature reaching 38.9° C..

A similar vaccine injected on the sixth day of the relapse brought the temperature below normal and there it remained. Sloughs of considerable size were passed for a period of about three weeks. There was no associated hæmorrhage. After vaccine therapy, the serum gave a Widal reaction to *Bacillus typhosus* in increasing dilutions up to a maximum of 1: 50,000, the maximum dilution for *Bacillus paratyphosus B* being 1: 3,200.

The diagnosis of the malady was indefinite; it must have been typhoid fever, paratyphoid or both. But, in any case, the therapeutic results of the vaccine treatment given intravenously were striking.

CASE V.—S.A., female, aged 18 years, was admitted to hospital with a typical history and clinical picture of moderately severe typhoid fever. She had been in bed for seven days. A Widal reaction was obtained in a dilution of 1: 400.

From the seventh to the eleventh days of the disease the temperature had ranged constantly about 39.4° C..

On the eleventh and thirteenth days an intravenous injection of 250 millions of *Bacillus typhosus* and 125 millions each of *Bacilli paratyphosi A et B* was given. After these two injections the fever became of mild grade, ranging between normal and 37.8° C. for the remainder of the febrile period of 26 days. The temperature was kept within these limits by further vaccines on the seventeenth, twenty-third and twenty-fifth days. The temperature chart was very definitely influenced in this case and if vaccines had been pushed daily in the earlier periods of the disease, the case might have been aborted.

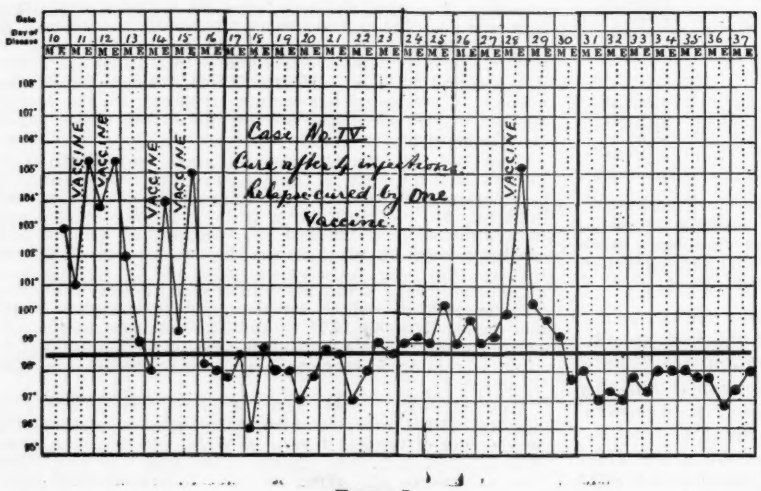


FIGURE I..

Bacillus typhosus was still present in the fæces when the patient was discharged.

CASE VI.—P.M., male, aged 30 years, was admitted to hospital with a definite history and clinical picture of severe typhoid fever. There had been a moderate hæmorrhage *per rectum* before admission.

On the fifteenth day, a vaccine of 275 millions of *Bacillus typhosus* was given and an excessive reaction followed, the temperature reaching 42° C.. Within 24 hours there was a

fairly severe intestinal hæmorrhage. Vaccines were given on the four succeeding days, the dose being reduced to 150 millions of *Bacillus typhosus*.

There was no prolonged effect on the temperature, despite similar additional doses on three occasions within the next eight days. Toxæmic symptoms were conspicuous by their absence and the patient, except for the hæmorrhage occurring shortly after admission, made an uninterrupted recovery.

CASE VII.—M.H., female, aged 17 years, was admitted to hospital with the diagnosis of acute appendicitis.

After being watched for a few days in a surgical ward, she was transferred to the medical side of the hospital, because it was thought that her illness was probably typhoid fever. There was a history of indefinite ill-health for the previous four months.

During the four days prior to admission there had been general abdominal pain, some vomiting and constipation. Six days after admission a Widal reaction was obtained in a dilution of 1: 160. The spleen was not palpable, but a few rose spots were scattered over the abdomen.

On the tenth, twelfth and sixteenth days the patient received a vaccine of 200 millions of *Bacillus typhosus*, with one hundred millions each of *Bacilli paratyphosi A et B*.

Excessive reactions followed, the temperature reaching between 41.3° C. and 41.6° C. on each occasion. The temperature curve was otherwise unaffected and smaller doses of vaccine on the nineteenth and twenty-first days merely resulted in excessive temperature reaction. Toxæmic symptoms, however, were absent within forty-eight hours of the first injection.

CASE VIII.—E.F., female, aged 28 years, was admitted to hospital with the history and clinical features of severe typhoid fever. She had been in bed for the past ten days. On admission she presented marked toxæmic features. Within the first week after admission she received three injections of 200 millions of *Bacillus typhosus* and 100 millions each of *Bacilli paratyphosi A et B*. The temperature chart was quite uninfluenced. Two additional vaccines in the next ten days were also without effect on the pyrexial course of the disease.

All toxic symptoms completely disappeared within twenty-four hours of the first injection.

This patient had a pyelitis (*Bacillus coli*), which may have prolonged the pyrexial period. Within a week of the administration of hexamine this complication subsided and the temperature became normal.

In the last two cases it would appear that the vaccines were given at too long intervals to have a prolonged effect on the pyrexial course of the disease.

The abatement of all toxæmic manifestations within a few days of receiving vaccine treatment was undoubtedly the most striking clinical result of this treatment in these eight cases.

Detailed Observations on Vaccine Administration.

The Type of Vaccine.

Two different vaccines were used in this investigation. Two of the patients (Case II. and Case VI.) received a monovalent vaccine (*Bacillus typhosus*) and the remainder stock "T.A.B." vaccine containing *Bacillus typhosus*, *Bacillus paratyphosus A* and *Bacillus paratyphosus B* in the proportion of 2 : 1 : 1.

In both vaccines the organisms had been killed by heat (60° C. for an hour) and 0.5% phenol was then added in 0.85% saline solution.

Sensitized typhoidal vaccines have been advocated by some workers, but unless the treatment is instituted very early in the disease, *i.e.*, prior to any antibody formation by the patient's tissues, there appears theoretically to be no advantage in the procedure. Published reports, however, suggest that the reactions may be less severe.

Dosage of the Vaccine.

The dosage used in this series has varied between seventy-five millions and three hundred millions of *Bacillus typhosus*. One hundred and fifty millions appears to be a safe initial dose for an adult in practically all cases. Large initial doses are to be avoided. The pyrexial reaction usually bears a definite relationship to the quantity of bacterial protein injected. Excessive reactions are not advisable, hence treatment should be initiated with small doses and, if necessary, the amount of vaccine used can subsequently be increased according to the sus-

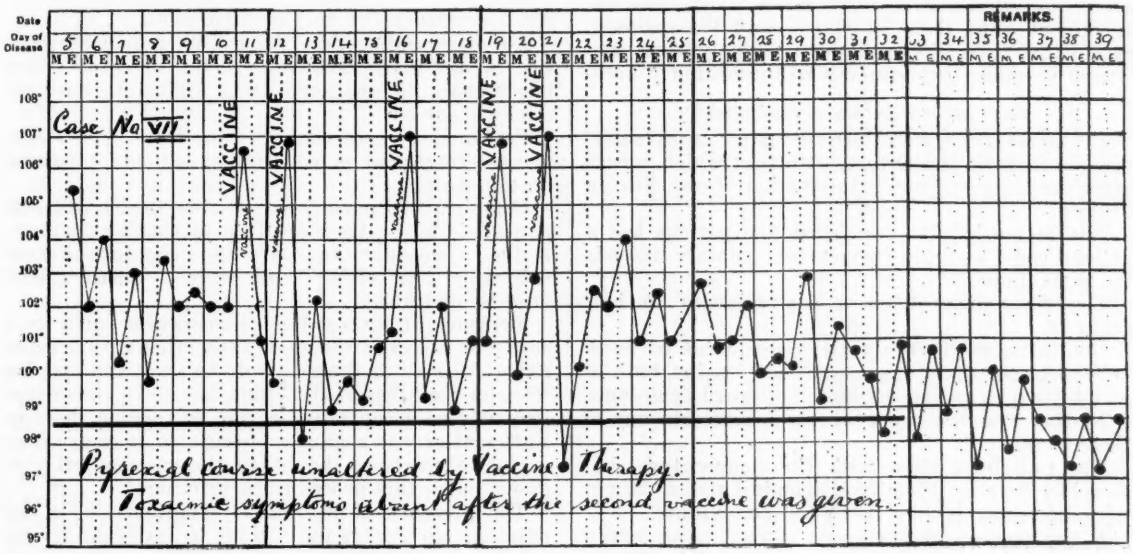


FIGURE III.

ceptibility of the patient. A perusal of Table II. shows that the highest temperature recorded in any reaction in the four cases of those who were cured by crisis was not greater than 40.8° C.. In the other four cases where the fever persisted, temperatures of 41° C. or over were recorded in at least one, if not more, of their reactions to vaccine therapy. Hyperpyrexial reactions are therefore unnecessary, the optimum reaction temperature being at most 40.5° C..

The Mode and Frequency of Administration of the Vaccine.

The skin at the bend of the elbow is sterilized with spirit, followed by tincture of iodine, and a rubber tourniquet is applied to the arm. The needle of a hypodermic syringe containing undiluted vaccine is then inserted into one of the congested subcutaneous veins in this region, the piston is withdrawn and a small quantity of blood is aspirated into the syringe. This shows that the needle is lying within the vein. The tourniquet is then removed and the vaccine injected.

At first these patients received their vaccines at intervals of from three to seven days, but latterly daily injections have been given. My conclusion is that the best routine treatment consists of an initial dose of 150 millions of *Bacillus typhosus*, increased to 250 millions on subsequent occasions, if the reaction has been mild. The vaccine is given daily for four to six days. If there be no definite alteration in the temperature chart after this course of treatment (six daily injections), there is little use in subjecting the patients further to a series of uncomfortable pyrexial reactions. Even though the temperature chart remain unaltered, prior to the last injection there will be manifest the marked amelioration or complete disappearance of all toxæmic features and the subsequent course of the disease will have been effectively modified.

These conclusions concerning dosage and frequency of administration of vaccine are in complete agreement with those of Gay[4] and Galambos,[5] except that these observers advocate polyvalent sensitized vaccines in preference to the ordinary ones.

The Febrile Reaction of the Patient.

The pyrexial reaction observed after intravenous vaccine therapy is identical with that which occurs after the intravenous administration of any foreign protein.

Within one-half to two hours the patient has a violent rigor and the temperature rapidly ascends to its maximum.

The rigor lasts from a few minutes to half an hour.

Not infrequently the patient complains of headache and sometimes of general bodily pains, both of which yield to aspirin without untoward symptoms.

Neither dyspnœa nor cyanosis occurred in any of these cases.

The pulse-rate rises with the temperature, but to a less degree. Usually it remains under 120 per minute; rarely it may reach 150 per minute.

If the vaccine be given soon after a meal, vomiting may occur. The temperature usually remains high for from one to six hours and then may fall gradually or rapidly to below normal. Within twelve to thirty-six hours the temperature is usually subnormal.

If cure be affected by crisis, the temperature does not subsequently rise above normal, but often it gradually ascends and within forty-eight hours is again above normal.

It is usually better not to wait for this subsequent rise, but to give vaccines daily for a few days, as indicated above.

The Contra-Indications to Vaccine Therapy.

As far as can be ascertained from the available literature, this pyrexial reaction has never resulted fatally, provided the vaccine has been killed by heat.

The contra-indications to the intravenous administration of vaccine are stated by different observers to be as follows:

(*i.*) Hæmorrhage.
(*ii.*) Perforation.
(*iii.*) Pneumonia.
(*iv.*) Myocardial degeneration.
(*v.*) Meningeal symptoms.

In Case VI. of this series there had been an intestinal hæmorrhage prior to admission to hospital. Following a large dose of vaccine (275 millions of *Bacillus typhosus*), there was an excessive febrile reaction (temperature, 41° C.) and within twenty-four hours about 500 c.cm. to 600 c.cm. of blood was lost *per rectum*. On the next day no vaccine was given, but on the following four days a daily dose of 150 millions of *Bacillus typhosus* was given without any untoward results. There was no further hæmorrhage. The toxæmic manifestations completely disappeared and, though the pyrexia continued unabated, the patient made an uninterrupted recovery. No other instance of anything suggesting a focal reaction of any intensity occurred in the series. Indeed, focal reactions are so rare that, when they are recorded as occurring, they are probably accidental and independent of vaccine treatment.

Notwithstanding this probability, it is good practice to use small doses of vaccine in cases where hæmorrhage is suspected or is known to have recently occurred.

Perforation necessitates immediate operation; vaccine treatment is a matter of secondary consideration only.

Complicating pneumonia, if due to *Bacillus typhosus*, is no contra-indication to vaccine therapy; if due to secondary invaders, the procedure is more debatable. In either case, only a small initial dose is advisable.

Evidence of myocardial degeneration, such as a soft first sound at the apex, associated with a rapid pulse, fullness of the veins of the neck and crepitations at the bases of the lungs, has to be considered seriously as a contra-indication to vaccine therapy. Sufficient care in regard to dosage, so as to avoid an excessive reaction, should, in the vast majority of cases, make this procedure a safe one.

The presence of meningeal symptoms is, in my opinion, no contra-indication to careful vaccine treatment. Lumbar puncture may produce beneficial effects in this type of case.

The Immunity Response in Intravenous Vaccine Therapy.

I.—The Cellular Response.

The cellular response in infections treated by vaccines given intravenously is definite and remarkable. Clinically, it has been shown repeatedly that the initial rise of temperature following the vaccine is accompanied by a leucopenia and the fall of temperature by a leucocytosis, often higher than twenty thousand cells per cubic milimetre. Both the leucopenia and the leucocytosis are due to the decrease and increase of the polymorphonuclear elements, the lymphocytes remaining approximately constant throughout the various phases of the reaction.

The eosinophile cells are greatly reduced in typhoid fever, but they are increased within a few hours of the injection of vaccine.

Gay and Claypole[6] found that the intravenous injection of living *Bacillus typhosus* in immunized rabbits or of living sensitized *Bacillus typhosus* in normal rabbits caused a leucocytic crisis about eighteen hours later, which was accompanied by complete destruction of the injected living bacilli.

II.—The Humoral Response.

The humoral response in this series has been investigated by means of agglutination and complement fixation tests, cultures of *Bacillus typhosus* being used as antigen.

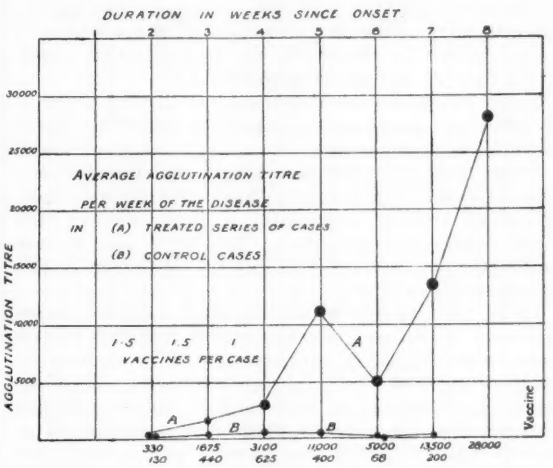
That a definite serological response is produced in the persons treated has been shown by the extraordinarily high titre agglutination curves obtained from the sera of these patients and the strong complement fixation reactions observed.

Agglutination Reaction.

Gay observed that in persons cured by treatment with sensitized vaccines, their serum gave Widal reactions in what he termed a high dilution, namely, 1:640.

In my series, however, Patterson and Williams showed that the average maximum agglutination was 1:20,700 and this despite the fact that two patients received only one injection. The control series showed an average maximum aggutination titre of 1:1,800.

Table III. shows the average agglutination titre recorded for each week of the disease in the treated series:



GRAPH I..

The high average agglutination titre of the treated cases is better appreciated when it is shown graphically. Graph I. illustrates the average titre of the treated series compared with that of the control cases.

The daily rise of agglutination titre in the treated cases has been worked out by Patterson and Williams. This is shown in Graph II. where the agglutination titre of Case III. of the series is plotted out against that of a typical case from the control series.

Two patients who were not suffering from typhoid fever, were given intravenous injections of vaccines of *Bacillus typhosus* daily for four and six days respectively.

A patient suffering from rheumatoid arthritis received four successive daily injections of 150 millions of *Bacillus typhosus*; 600 milions in all. A patient suffering from asthma[1] was given vaccines on six successive days, the dosage varying from 100 to 250 millions. Altogether a total of 1,150 millions

[1] It is noteworthy that in the case of the patient with asthma the clinical results of the vaccine injections were excellent. The paroxysm stopped within twenty-four hours and complete freedom from further attacks has resulted for the past nine weeks. In the preceding eight years, the patient had suffered from recurrent attacks at intervals of three weeks; the longest interval had been six weeks. The attacks resist adrenalin; morphine, except in huge doses, has no effect.

TABLE III..

Case.	Second Week.	Third Week.	Fourth Week.	Fifth Week.	Sixth Week.	Seventh Week.	Eighth Week.
I.	1:60 V_1	1:600	1:320	1:320	1:160		
II.	1:160 V_1	1:600	1:1,280	1:640	1:500		
III.	1:560 V_3	1:900 V_3	1:14,000	1:62,500	1:12,000	1:7,000	
IV.	1:640 V_2	1:9,000 V_2		1:12,000 V_1	1:12,800	1:25,000	1:50,000
V.	1:400 V_2	1:400 V_1	1:1,100 V_2	1:3,200	1:5,000	1:25,000	1:8,000
VI.		1:160 V_5	1:950 V_3	1:3,200	1:2,000		
VII.	1:400 V_2	1:1,280 V_2	1:3,200 V_1	1:5,000	1:6,400	1:2,800	
VIII.	1:120 V_2	1:440 V_1	1:750 V_1	1:480 V_1	1:1,280	1:8,000	1:16,000
Average	1:330	1:1,675	1:3,100	1:11,000	1:5,000	1:13,560	1:28,000
Average of Control Series	1:130	1:450	1:625	1:415	1:70	1:200	

The sign "V" with the number following it indicates the number of injections of vaccine given in that particular week.

of *Bacillus typhosus* was administered. The agglutination titre of the sera of these two cases was estimated daily. In Graph II. the agglutination curve of the case of asthma is plotted out.

Table IV. shows the agglutination titre of the sera of these two cases on various days after the injection of the first vaccine.

From these observations on both typhoid and non-typhoid cases it is obvious that intravenous application of vaccine stimulates a very critical and rapid serological response. The high rise is not well sustained, a rapid fall in titre occurring in the subsequent few days.

It is well known clinically that *Bacillus paratyphosus A* evokes little agglutinin response in the body, while *Bacillus paratyphosus B* is capable of eliciting marked agglutination reactions. It is interesting, therefore, to note that of the six patients who received the mixed typhoid and paratyphoid A and B vaccine, only one yielded any subsequent agglutination to *Bacillus paratyphosus A*, while only one failed to develope an agglutination response to *Bacillus paratyphosus B*.

Complement Fixation Reaction.

The complement fixation reaction was investigated in eleven cases of typhoid fever, a polyvalent saline suspension of *Bacillus typhosus* being used as the antigen. In all cases reactions were observed at some period of the fever or during convalescence, but in the four treated patients more intense quantitative reactions were recorded over corresponding periods of the disease than in the cases of the non-inoculated patients.

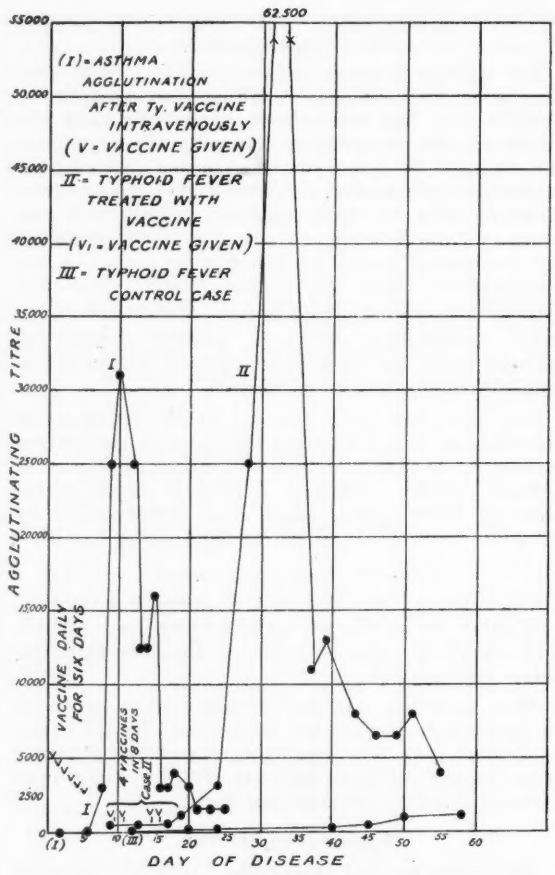
The increased and better sustained antibody content of the blood in the treated patients corresponds with the high agglutinin content of their sera already referred to. It is to be regarded as additional proof of a specific serological response to typhoidal protein produced by this intravenous vaccine therapy.

During convalescence the sera of two of the treated patients actually fixed twelve minimum hæmolytic doses of complement, while the other two fixed six and four and a half minimum hæmolytic doses of complement respectively.

The Mechanism by Which Beneficial Results are Obtained in Intravenous Vaccine Therapy.

The *modus operandi* of this treatment is debatable. Ichikawa has suggested that the reaction is an anaphylactic one in a sensitized patient, who thereafter developes a condition of insusceptibility to these same proteins.

Gay thinks that the cure is due to the co-operation of the leucocytes and the substances antagonistic



GRAPH II..

to *Bacillus typhosus* in the serum, *i.e.*, a true immunity response. But the lymphocyte is the cell specially called forth in the defensive cellular response in typhoid fever, while the polymorphonuclear elements are in abeyance.

On the other hand, the polymorphonuclear cell and not the lymphocyte is the cause of the leucocytosis following intravenous vaccine therapy. Certain complications occurring in typhoid fever, such as perforation and pneumonia, may stimulate a critical polymorphonuclear leucocytosis, yet the course of the disease is not modified. Obviously, therefore, factors other than a polymorphonuclear leucocytosis are essential.

In this series of cases, it has been definitely shown that specific antibodies against typhoidal protein

TABLE IV.—THE NUMBER OF DAYS AFTER THE INJECTION OF THE FIRST VACCINE.

Case.	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Arthritis	1: 10	1: 100	1: 1600	1: 4000	1: 8000	—	1: 9600	1: 6400	1: 3200	1: 5600	1: 4000	1: 4000	—	1: 4000
Asthma	—	1: 200	—	1: 3000	1: 25000	1: 31250	—	1: 25000	1: 12800	1: 12800	1: 16000	1: 3200	1: 3200	1: 4000

It will be seen from this table that in both these cases within five days of the first injection positive agglutination reactions had developed and within ten days the maximum agglutination was attained. The depreciation in titre subsequently was rapid (see Graph II.).

have been produced in great quantity. It is difficult to accept any view suggesting that the remarkable clinical improvement is independent of a specific immunity response. However, Kraus and other observers claim that equally good results are obtained with *Bacillus coli* vaccines and they therefore argue that the reaction is not a specific one.

At a later period I hope to collect more data on this interesting problem.

Conclusions.

1. The intravenous administration of typhoid vaccine in appropriate doses is of great value in the treatment of this disease and should become universally adopted. It should be emphasized that vaccine treatment does not replace the ordinary routine treatment of typhoid fever, but it is a very valuable addition to our therapeutic armamentarium.

2. Provided reasonable care is taken in administering the correct amount of vaccine at the initial injection, neither excessive febrile nor focal reactions need be feared. The contra-indications to this treatment are extremely few.

3. The advantages claimed in my unselected series of treated cases are:

(*a*) The dramatic termination of the fever by crisis in 50% of cases following vaccine administration.

(*b*) The marked amelioration or complete abolition of the toxæmic features of the disease in all the treated cases.

(*c*) The absence of a fatal issue in the series of eight treated cases, the mortality rate in the control series being 14.3%.

Acknowledgements.

In conclusion, I would like to express my thanks to the various members of the honorary medical staff of the Melbourne Hospital, especially to Dr. H. Turnbull, Dr. R. R. Stawell and Dr. W. R. Boyd for their assistance and interest in this investigation; to Dr. S. W. Patterson, Miss F. E. Williams and Dr. N. Hamilton Fairley, of the Walter and Eliza Hall Institute of Research, for their help throughout, in particular for their investigations of the serological responses of these patients, agglutination and complement fixation reactions.

References.

(1) Ichikawa: *Mitteilungen der Medizinischen Gesellschaft zu Osaka, Band* X., No. 5, April, 1912; *Zeitschrift für Immunitätsforschung,* XXIII., page 32, May 6, 1914.

(2) Kraus, R.: *Wiener Klinische Wochenscrift,* XXVII., No. 29, page 1,143, June 10, 1914.

(3) Gay, F. P.: *Journal of the American Medical Association,* LXV., No. 4, page 322, July 24, 1915.

(4) Gay, F. P.: Quoted from "Infectious Diseases," page 366, by C. B. Ker, Oxford Medical Publications, 1920.

(5) Galambos: *Ibidem,* Reference (4).

(6) Gay, F. P., and Claypole, E. J.: "Specific Hyperleucocytosis," *Archives of Internal Medicine,* page 662, November, 1914.

Reports of Cases.

TWO INTERESTING CASES.

By J. J. Woodburn, M.B. (Sydney),
Honorary Aurist, the Renwick Hospital for Infants; Honorary Assistant Surgeon for the Ear, Nose and Throat Departments of the Royal Prince Alfred and St. Vincent's Hospitals.

IN the following I am recording two interesting cases of conditions which are usually fatal. The one is a case of osteo-myelitis with cure; the other is one of septic thrombosis of the cavernous sinuses with purulent meningitis with fatal issue.

Case I.—Acute Osteo-Myelitis.

E.B. had been ill for two months. He first developed a painful lump on his forehead, which prevented him from wearing his hat. He was sent into hospital and the doctor opened "an abscess." The patient was showing meningeal symptoms with pyrexia. After "the abscess" had been opened, his condition improved, but later there was a recurrence of the abscess and a fresh opening was made. Some pieces of bone were removed with the pus. He did not get better and was sent to Sydney. When he consulted me he had a fluctuating swelling over the left side of the forehead and I could feel what seemed to be small pieces of bone in the contents of the swelling.

I considered he had frontal sinusitis with osteo-myelitis and sent him for operation to the Royal Prince Alfred Hospital.

An X-ray examination revealed that both frontal and ethmoid sinuses were dull. The right frontal sinus proved not to be infected, but the osteo-myelitis encroached a little on the right side of the middle line.

At the first operation I made an incision over the left eyebrow, as for a radical operation and removed all the loose bone. A few days later Dr. Marks, with Dr. Godsall and myself as assistants, made an angular incision, following the sagittal line for about 6 cm., and enlarged the lateral incision. All the remaining dead bone and granulations were removed until the healthy meninges were exposed. Hot saline solution was continually poured on during the operation. A large opening was then made into the nose and also into the anterior ethmoidal air cells. Fully one-third of the frontal bone was diseased and removed. The wound was left open and frequent applications made of gauze soaked in eusol. Three and a half weeks afterwards the flap was sewn across and the external wound closed, the opening into the nose being enlarged at the same time.

A piece of bone, removed at the first operation, was placed on plasma agar and incubated, *Staphylococcus albus* being cultivated. This, I believe, is the mildest form of infection. It is probable that this coccus was only a secondary invader, causing the osteo-myelitis of the frontal bone. A vaccine was made and eight doses were given. The patient was discharged cured two months and two weeks after the first operation.

He is now working at one of the counters at the General Post Office in Sydney. There is considerable deformity, but no recurrence has occurred.

Case II.—Septic Thrombosis of Cavernous Sinus.

The patient was admitted to St. Vincent's Hospital with symptoms of meningitis and marked exophthalmos. He had been employed in a metal quarry. Fourteen days before admission he received cuts about the arms and neck when at work and four days later he consulted his doctor, who noticed he had a squint. He did not consult his doctor again for several days and, when he did, he had exophthalmos with œdema and inflammation of the conjunctiva. He was then hurriedly sent to Sydney.

Shortly after admission he became unconscious, with loss of knee-jerks and increasing exophthalmos. There were several areas of erythema over the arms, neck and chest, probably septic rashes. A reddish area surrounded the cut on the neck. Nothing was detected in the nasal sinuses

or ears. The temperature chart was that of a grave septic condition. The patient died.

The report of the *post mortem* examination by Dr. P. Walton Smith was as follows:

"There was pus in the meninges. The cortex was the seat of a generalized acute congestion and the fluid in the lateral ventricles contained pus cells. The cavernous sinuses, on being opened, were found to be filled with thick, blood-stained pus; the longitudinal and lateral sinuses were free from pus. The spleen was considerably enlarged, due to active hyperæmia. The liver showed areas of fatty change. The heart was considerably enlarged, due to dilatation of all its chambers. There was no apparent endocarditis. Cultures from the brain, cavernous sinuses, spleen and heart's blood all gave pure growths of *Staphylococcus pyogenes aureus*."

Two explanations occur to me. The first is that the cavernous sinus infection was primary, although no septic condition in the nose was discovered. It may have spread from the rash around the neck wound, through the angular veins and ophthalmic veins. The meningitis and septicæmia were secondary. Or it may have been that an infection of one of the wounds about the arms or neck resulted in a septicæmia and meningitis, causing thrombosis of the cavernous sinus. The former seems the more likely explanation.

The treatment was general.

Patients with septic thrombosis of the cavernous sinuses only recover when the infection has spread from infection of the lateral sinus and the lateral sinus is opened and drained.

Reviews.

VENEREAL DISEASE.

A MOST remarkable little book has been written by a highly trained woman of science, Miss Marie Stopes, at the request or with the approval of Professor Bayliss, Sir James Crighton-Browne, Dr. Jane Hawthorn, Sir William Arbuthnot Lane and Sir John MacAlister.[1] The following extracts from the preface indicate the nature and the purport of the work:

"These diseases generate the worst menace to happy and healthy marriage. This fact convinces me that all my work on behalf of the true understanding of pure love is jeopardized by the horror wrought by these invisible enemies, the germs of the sex diseases. This realization made me willing to attempt to write about the subject. At first, like every normal and healthy person, I shrank from even acquainting myself with the utterly detestable facts, but once I was acquainted with them, no course seemed possible but that resulting in this book."

Dr. Stopes follows a logical programme and suggests an obvious analogy. The first chapter is devoted to the use of disinfectants in all infectious diseases. She then gives an account of the appalling damage done by syphilis and gonorrhœa. In the third chapter she lays down the postulate that happy marriage is the basic fact in civilization. Then follows an account of the mode by which venereal infection is produced and the means by which infection may be prevented if poeple expose themselves to risk outside marriage. The whole amounts to one constant appeal for clean living, but, at all events, for personal cleanliness if people must be immoral. In discussing the amount of damage that is being done at present, it appears that the previous estimate of the cost of venereal diseases to the United States of America of £625,000,000 sterilng *per annum* is now regarded as an underestimate. The book is remarkable, since the writer, whilst under no illusions, keeps her eyes steadily fixed on the essential foundation of society, a healthy family, reared in a healthy home, and yet gives directions for the avoidance of infection by those people who do not live up to this ideal, since she realizes that the innocent are punished in appalling numbers. She faces the position honestly and gives the only sensible advice possible. Her attitude is summed up in the following paragraph which concludes the work:

"It is the duty of the churches to win the people by moral precepts and teaching to a right view of life and pure living; it is the duty of the doctor to see that people are decently clean; it is the duty of the reformer to see that people know facts essential to their life and progress. In this respect the moralist and the doctor have essentially the same message to teach."

It is indeed a sign of the times when educated women openly face the problem and write with accuracy and good sense for the benefit of mankind.

[1] "The Truth About Venereal Disease," by Marie Carmichael Stopes; 1921. London: G. P. Putnam's Sons, Ltd.; Sydney: Cole's Book Arcade; Crown 8vo., pp. 52. Price: 3s. 9d.

PHYSIOLOGY.

THERE must be a considerable demand for a book which has reached its fifteenth edition, yet Brubaker's "Compend of Human Physiology"[1] is a thoroughly bad book to put into the hands of medical students. A perusal of the book suggests that it was written many years ago as a condensation of a larger book and that from time to time a sentence or a paragraph here and there has been rewritten in an endeavour to keep it up to date.

The information given is in many cases so brief as to be misleading and loose statements which have no clear meaning, abound.

The biochemical parts of the book, in particular, require considerable revision. Proteins, fats and carbo-hydrates are dismissed in a few lines and are considered only in connexion with foods, while amino acids are barely mentioned.

Vitamins are not mentioned; the statement is made that, "when deprived of these acids (vegetable acids), the individual becomes scorbutic." Fibrinogen is stated to be obtained by "strongly diluting serum and passing carbonic acid through it for a long time."

Some sections of the book give brief but clear accounts of the subjects treated; but enough has been said to indicate that the book cannot be relied upon as a guide to modern physiology.

[1] "A Compend of Human Physiology: Especially Adapted for the Use of Medical Students," by Albert P. Brubaker, A.M., M.D.; Fifteenth Edition; 1921. Philadelphia: P. Blakiston's Son & Company; Crown 8vo., pp. 264, illustrated by 26 figures. Price: $2.00.

DERMATOLOGY.

DR. KNOWSLEY SIBLEY'S work on the treatment of diseases of the skin[2] is now in its third edition and the author has brought it up to date. The more modern methods of treatment are dwelt upon, but the book is not greatly enlarged. He has introduced a short discourse on diathermy and baths and one also on Delhi boil or Oriental sore. The chapters on diet and gastro-intestinal influences have also been augmented.

The author has endeavoured to carry out the title of the work and devotes himself mainly to treatment, the diseases themselves only receiving a short description. There are 24 plates illustrating well marked or rare diseases. At the end of the book is an excellent collection of 156 prescriptions, all numbered, so that they can be made use of in the letterpress of the work. In reading the book we are struck with the variety of methods of treatment which can or may be used. This is well exemplified in the case of eczema and it is here that the general practitioner will have to ponder to enable him to decide which out of all will give him the best and quickest results. The author, in trying to give all, has spoilt it by giving far too much. The modern methods of treatment by X-rays, radium, ionization, etc., are all dealt with and thus make it a useful work for the general practitioner and dermatologist.

[2] "The Treatment of Diseases of the Skin," by W. Knowsley Sibley, M.A., M.D., B.C., M.R.C.P., M.R.C.S.; Third Edition, 1920. London: Edward Arnold; Demy 8vo., pp. 248, with 24 plates. Price: 12s. 6d. net.

The Medical Journal of Australia

SATURDAY, NOVEMBER 12, 1921.

The Third Anniversary.

NOVEMBER THE ELEVENTH is a date that stands for the achievement of a great object. No one living can forget how the news was received in the Commonwealth three years ago. No one can allow this date to pass without recalling the feelings of that moment and without paying homage to those whose superlative courage and devotion to duty led to this consummation. Death, the inexorable, removes from our midst a steady stream of our colleagues, to the chagrin of their friends and often to the dismay of the whole profession. Still the world of medicine pursues the even tenor of its course; the dead are soon forgotten in the hurry and bustle of life. The men who fell in the Great War cannot be forgotten as these others. Young, full of promise, daring and great in their devotion to duty, they have earned immortality. The Branches of the British Medical Association are preparing or have prepared suitable symbols of the gratitude felt by the living for these heroes. In a few days a memorial tablet will be unveiled in the Library of the New South Wales Branch of the British Medical Association. A monument to the fallen is being fashioned and will in due course be placed in the home of the Victorian Branch of the British Medical Association. These and the other memorials are outward and visible signs of our feeling of gratitude, admiration and intense respect for our dead colleagues. The Eleventh of November is their day.

IN HONOUR OF A GREAT MAN.

KNOWLEDGE is Power. Bacon's aphorism finds its justification in each age and in every sphere of life, sometimes in almost trivial application, sometimes in relation to matters of the utmost importance to mankind. Rarely has this saying had a truer foundation than in the life and influence of the great founder of the Medical School of the University of Sydney. He built up a monument dedicated to knowledge and learning and the power of this institution is recognized on all sides. He infused into all his greater undertakings the doctrines of truth and the spirit of information. The force that lay behind all his activities cannot be questioned. And in that magnificent edifice which he built up, step by step and department by department, there survive all the elements of real power. It is so solidly founded that, in the countless years to come, while its originator lies sleeping peacefully, the school of medical knowledge must remain a permanent institution, ranking among the greatest in the world.

Those with whom he associated, his contemporaries, his colleagues, his assistants and his students have determined that the life work of Thomas Anderson Stuart should be commemorated in a suitable manner. Some time ago the University of Sydney Medical Society, a body created by him, resolved to find a means whereby the memory of the master would be worthily perpetuated. A public meeting was convened and at that meeting it was decided that the memorial should take the form of research fellowships. It was felt that progress in scientific knowledge had been dearer to his heart than anything else. Moreover, it was recognized that money invested in research work bears the highest rate of interest of all, the accumulation of knowledge for the benefit of mankind. The proposal that funds should be raised for the extension of the Royal Prince Alfred Hospital was brushed aside in favour of the foundation of research fellowships, for, while the former represents a valuable aid to a limited number of individuals, the latter may send its ramifications to the ends of the earth and into all time. The persons assembled at this meeting determined to ask the members of the medical profession, the members of the dental profession, the undergraduates in medicine at the University of Sydney and the general public of New South Wales to raise in the aggregate the sum of ten thousand pounds sterling for this purpose.

The appeal is directed in the first place to those who were personally associated with the late Dean of the Faculty of Medicine of the University of Sydney. As undergraduates in medicine and in den-

tistry they owe their *alma mater*, the environment of their student life, the beneficent influence of their great teacher and the proud boast that they studied in so renowned a school to Thomas Anderson Stuart. As medical and dental practitioners they rely on the knowledge of their profession which has been expanded within the University of Sydney under Anderson Stuart's guidance and influence and which will be extended through the instrument devised to perpetuate his memory. We feel that little persuasion will be needed to induce those who have been privileged to work for or with Anderson Stuart, to contribute according to their means to this fund.

In the next place, the appeal is directed to those who are deeply interested in those institutions that claimed so much energy and active participation from him. They must recognize in the present state of the Medical School, of the School of Dentistry, of the Australian Institute of Tropical Medicine at Townsville, of the Royal Prince Alfred Hospital and of many hygienic and sociological movements the handiwork of Anderson Stuart and must feel that this recognition should be moulded into a tangible form. The scientist and the sociologist, the economist and the patriot will all realize the inestimable value of research work, properly directed, and particularly research work in medicine. Too little has been spared for this kind of work in the Commonwealth in the past. The opportunity to support it is now offered. If the Australian research worker is given a chance, he will compete successfully with his contemporaries in other countries.

Then the appeal is addressed to the successful commercial man. The possession of money is desirable and of real worth if the money is wisely and profitably expended. Wealth added to knowledge increases the power attaching to the latter. The wealthy citizen need not be told how the accession of knowledge concerning the diseases to which man is heir, can be applied to increase the prosperity and wealth of the nation. The business man prides himself in his ability to evaluate a sound investment. Let him examine the prospectus of Research Company, Unlimited, and he will find that a higher rate of interest will be paid on capital invested than in any other undertaking. Let him think it over and ask for full details of the scheme. Any scientific medical practitioner will be able to convince him of the value of the investment.

The sum desired may seem large. In reality it is a modest amount. It represents but a small fraction of the amount wasted annually on diseases which devastate our race because we need more knowledge to prevent them. It is trifling in comparison with the sums thrown away on ephemeral pleasures and unproductive pastimes.

In this issue we publish the first list of sums subscribed and promised. One-tenth of the full amount has already been secured without any organized propaganda. If those to whom the appeal is addressed, will bear in mind its dual function, to commemorate the great work of the founder of the School of Medicine at Sydney and to further medical knowledge, the full sum should be in the hands of the Committee within a short time.

ADVENTITIOUS PULMONARY SOUNDS.

To the genius of Laennec the physician owes his understanding of the different types of breathing and the various adventitious sounds within the chest which are audible with the stethoscope. On the whole, there is now some uniformity of view in regard to the significance of the respiratory sounds. The majority of clinicians have very definite and almost unanimous opinions as to the description and the mode of production of these sounds. The classification of Laennec has been amplified and perfected. The same cannot be said, however, in regard to the multitude of sounds which are described by some as rhonchi, by others as râles and by others still as rhonchi or râles according to their characters and modes of production. Reference to textbooks on physical signs will reveal the appalling confusion which exists in regard to these sounds. Laennec labelled them all rhonchi and divided them into moist, mucous and dry types. Moist or crepitant rhonchi, according to this classification, are those which are comparable to the sounds produced by friction of the hair close to the ear with the fingers. They are heard typically in pneumonia and are said to be due to the opening-up of collapsed air sacs containing fluid. Mucous rhonchi are the coarser bubbling sounds produced by the passage of air through the fluid contained in the larger bronchi. The coarse "consonating" rhonchus which obtains its exaggerated quality from its transmission through consolidated lung tissue, belongs to this group. Dry rhonchi include the snoring and whistling sounds heard in every definite case of acute and chronic bronchitis and those crepitations which have a dry as distinct from a moist quality.

This classification was adopted by Samuel Gee in his admirable work, "Auscultation and Percussion," now unfortunately out of print. Gee, however, substituted the description "râle" for rhonchus. Austin Flint adopted a nomenclature which had an anatomical rather than a qualitative basis. According to him, adventitious sounds are râles and they are laryngeal, tracheal, bronchial, vesicular, cavernous or pleural. Those which defy accurate orientation, are called "indeterminate." The elder Da Costa adopted Flint's principle of a nomenclature based on anatomical considerations. More recently there has been a strong tendency to combine anatomical and qualitative descriptions, with the result that no two text-books on the physical examination of the lungs are quite alike. The student becomes bewildered at the multiplicity of classifications supplied by his teachers and described in the text-books. With the more mature experience which follows graduation, he learns to understand more thoroughly each sound and to build up a classification of his own. This deplorable lack of standardization reacts severely on the student's education. Passing from teacher to teacher, any definite idea learnt from the one is quickly rendered unstable by the new knowledge gained from the other.

Recently Dr. J. Birnie Guthrie[1] has put forth a plea for a classification of his own. He assures us that if we recognize only three groups of râles—"crepitant or vesicular, mucous or tube and cavernous"—it will be possible to classify every râle. Pleuritic friction sounds are, of course, excluded. It will be seen that Dr. Guthrie has adopted the usual hotch-potch of anatomical and musical phraseology. His classification is no more than a re-shuffle of the old names. Laennec's description had the virtue of consistency in that he sought to interpret the quality of the sound transmitted to the ear by the stethoscope. Austin Flint's classification represented a brave attempt to localize the hiding-place of every adventitious sound. Latter-day tutors, of whom Dr. Guthrie is no exception, recognizing that accurate anatomical localization is impossible, have adopted a sorry mingling of two terminologies.

Much of the present confusion could be avoided if an accurate distinction were made between the two words rhonchus and râle. A rhonchus means a roaring or whistling sound and should be applied only to sounds of that character heard in cases of bronchitis. The terms "sibilant rhonchus" and "sonorous rhonchus" convey a definite acoustic as well as anatomical significance. There is reasonable cause to believe that rhonchi are produced by the passage of air along a bronchus which is partially obstructed by a plug of mucus. If the bronchus is small, the sound is sibilant, if it is large, the sound is sonorous. A râle, on the other hand, conveys the idea of sounds produced in cavities and in air-spaces rather than in pipes or bronchi. It suggests the explosion or cracking of small drops of fluid by sudden admixture with air in small closed spaces. A râle is, in other words, produced within the substance of the lung proper. Confusion may also be avoided by elimination of the designations "moist" and "dry." All râles or rhonchi are moist in that they depend upon the presence of fluid within the lung or bronchi for their production. The only sounds which can with any truth be called "dry," are friction rubs which are produced by the over-riding of thickened, dry pleural surfaces on one another. Unfortunately, many fine râles or crepitations are of undetermined origin. It is impossible to decide whether they originate in the pleura or in the pulmonary vesicles. Still, in the majority of instances râles are produced within the lung and if the student learns to appreciate this simple fact, his understanding of physical examination of the chest will be rendered more complete.

[1] *The American Journal of the Medical Sciences*, September, 1921.

A SMALL PLAGUE EPIDEMIC.

LAST year there was a small plague epidemic in four ports of the Gulf of Mexico. The history of the outbreak at Galveston is both interesting and instructive.[1] Between June 16 and November 13, 1920, eighteen persons were infected within the city, of whom twelve died. There were two infections in June, three in July, six in August, three in September, three in October and one in November. The authorities had no information concerning the existence of a rat epizootic prior to June 16, 1920. A curve plotted of the percentage of infected rats among those trapped or caught in other ways reveals an irregular course of the epizootic. Dr. Mark F. Boyd and Dr. T. W. Kemmerer call attention to the fact that the infected rats secured in the trapping operations represent a random selection of the total number of infected rats in the infected area. In ten instances infected rats were caught within a two-block radius of the home or of the place of employment of a patient before the latter showed signs of disease. In six instances the human infection was noted first and infected rats were subsequently found within the area. Further, in fifteen two-block zones in which infected rats were discovered, no disease occurred among human beings. The reason for this appears to be that the local epizootic was detected before it had become extensive. In the early stages of the epizootic the rat population is not reduced to such an extent that the rat fleas are forced to seek other hosts. It is easy in these circumstances to destroy the majority if not all of the rats and their fleas by means of fumigation with cyanide vapour. All but one of the infected rodents were *Mus norvegicus*. The majority of the rats were found to have the five classical lesions of the epizootic, namely, injection, bubo, granular liver, congested spleen and pleural effusion. The buboes were usually multiple. The measures employed to secure rat freedom were trapping, removal of rat harbourage, rat proofing and fumigation. It would seem as if the rat campaign had been skilfully directed, since the number caught diminished rapidly and remained at a relatively low figure during the period of control.

[1] *Public Health Reports of the United States Public Health Service*, Volume 36, Number 30, July 29, 1921.

Abstracts from Current Medical Literature.

PHYSIOLOGY.

(210) The Vaso-Motor Mechanism of Capillaries.

A. KROGH (*Journal of Physiology*, May, 1921) has observed microscopically the behaviour of capillaries in the tongue of the frog when that organ is subjected to various forms of stimulation. Reactions of capillaries may be independent of the simultaneous reactions of the arterioles and are always practically independent of arterial pressure. Mechanical stimulation of a small area of the tongue causes dilatation of the capillaries and arterioles over an area greater than the area stimulated. If the surface is anæmic before stimulation, many previously invisible capillaries are opened up. The dilatation of the capillaries occurs if, prior to stimulation, an adjustable clip is placed on the lingual artery and adjusted until the blood flow becomes very slow and the pressure therefore low. The fall of capillary pressure is measured by the apparatus of Roy and Graham. Urethane applied to a capillary causes complete relaxation of the capillary, but no action on the arterioles. The capillary may become filled gradually from an arteriole so narrow that the corpuscles are squeezed through one by one. In such a capillary stasis develops. The normal arterial pressure is much too low to overcome the resistance of contracted capillaries, though the venous pressure is often high enough to fill them when relaxed. Cocaine causes dilatation of both arteries and capillaries, but with a weak cocaine solution this effect is reduced. Mechanical stimulation, applied some twenty minutes or more later, does not bring about its usual effect of dilatation. The effect of local stimulation after section of both nerves supplying the tongue does not differ from the normal, but it is abolished if sufficient time is allowed for the nerve to degenerate before stimulation. Krogh considers that the reactions to local stimuli have no relation to true reflexes, since they are not altered by section of the nerves. The spreading of the dilatation over a larger area than that stimulated and the absence of dilatation in response to mechanical stimulation following the action of cocaine suggest that the reaction is due to local axone reflexes. The author assumes that sensory nerve fibres accompany the arteries and give off branches to the arterioles, the capillaries and the mucous membrane. The end organs are the organs of the cutaneous senses, especially the sense of pressure, and the nerve endings are both sensory and inhibitory to vascular tone. The question of capillary tonus is next considered. By ligature of the lingual artery for three to fourteen hours, it was shown that when the circulation was opened, there was a hyperæmia, with dilatation of arteries and capillaries. It is considered that capillary tonus is not entirely of nervous origin, but depends on the supply of blood to the capillary. A capillary vessel, which has been closed by tonic contraction for a certain period, will relax in consequence of the absence of blood. When a current of blood is admitted, the vessel will regain its tonus. Every capillary must alternately open and close and in the resting tissue, which is poorly supplied with blood, the position of open capillaries must be continually changing. The result is that the whole tissue is uniformly irrigated. The substance responsible for the tonic action of the blood is unknown, but evidence is advanced to show that it cannot be oxygen.

(211) Nitrogen Metabolism of the Submaxillary Gland.

DURING the protracted secretion of the submaxillary gland resulting from stimulation of the *chorda tympani* nerve in the dog, the saliva becomes less viscid and the excretion of mucin diminishes. As mucin is not the only nitrogenous compound excreted in the saliva, G. V. AUREP (*Journal of Physiology*, March, 1921) studied the question of the source of the mucin and non-mucin nitrogen in the secretion of the gland during activity. The experiments of Pavlov and others were repeated to prove that there was a nitrogen intake on the part of the active gland. The intake was estimated by subtraction of the nitrogen of the resting gland from the total of the nitrogen in the saliva added to that in the active gland. There is very little deviation in the nitrogen content of the right and left glands. The nitrogen content of the resting gland is estimated as the proportion of the nitrogen content of the gland on the opposite side of the body to the nitrogen content of the gland subjected to experiment. During secretion the mucin nitrogen was not formed after a time, but the non-mucin nitrogen remained a constant figure during the progress of the stimulation. The author shows that the loss of nitrogen by the active gland was equivalent to the amount of mucin nitrogen excreted into the saliva. The nitrogen intake of the gland is correlated with the excretion of the non-mucin nitrogen. The non-mucin nitrogen either represents a passive transport of some nitrogenous compounds from the lymph by the flow of water or it may be due to an active secretion by the gland of some nitrogenous substances which are eliminated from the cells and replaced at the same rate. The non-mucin nitrogen is thus equal to the excess of nitrogenous output in the saliva over the loss in nitrogen of the active gland. The mucin store in the gland is quickly diminished and this represents the actual loss of nitrogen by the gland. It comes entirely from the mucinogen stored in the gland. No formation of mucin or increase of nitrogenous cell substance takes place in the gland during stimulation of the *chorda tympani*.

(212) The Use of Oxygen in Œdema and Ulcer of the Leg.

LEONARD HILL (*Proceedings of the Physiological Society*, March, 1921) describes an oxygen bed tent for the continuous use of oxygen at 35 to 37 volume %. A soldier, whose femoral artery had been tied, complained of coldness of his leg. It became blue and œdematous and chronic ulcers formed on the limb. The patient was treated continuously with oxygen for 48 hours. The foot and leg became warm and of good colour, the œdema disappeared and healing of the ulcers commenced. The theoretical considerations which suggested treatment with oxygen, are as follows: Œdema is not due to a transudation from the capillaries produced by capillary pressure, but to the increased osmotic pressure of ill-nourished tissue cells. In the patient's leg want of oxygen was an obvious sign. This want led to the formation of degradation products in the tissues. These products caused the tissues to swell by the mechanism of osmosis. The swelling, by pressure upon the capillaries and veins, elevated the capillary venous pressure towards the level of the arterial pressure. A jet of water 200 cm. high was required to blanch the skin of the patient's foot when the foot was blue and swollen. A jet 50 cm. high was sufficient to produce a similar result in the normal foot. When the blood was saturated with oxygen, it was believed that the tissue cells would recover, the œdema disappear and healing of the ulcers take place. The results suggest that oxygen inhalation may contribute to the healing of ulcers and the relief of œdema due to defect of the circulation.

(213) The Tetanic Nature of the Voluntary Contraction in Man.

A. V. HILL (*Proceedings of the Physiological Society*, March, 1921) has shown that, by the aid of the hot wire sphygmograph it is possible to record in the string galvanometer the vibrations of the muscles of the human body. The hot wire sphygmograph was devised by the author for the purpose of obtaining photographic records of the pulse wave with the aid of the string galvanometer. It is known that a voluntary contraction in a human muscle provides electrical changes at the rate of about fifty a second and that a voluntary contraction is of the nature of a tetanus. If a glycerine tambour is placed upon any muscle in the body and joined to a pipe connected to a hot wire sphygmograph, the oscillations of the muscle cause vibrations of the air inside the tambour and pipe. The hot wire is cooled and an alteration of resistance is thus effected in the wire. This alteration causes a movement of the string galvanometer which can be recorded photographically. Reasons are advanced to show that the vibrations are not instrumental in origin. Photographic records show vibrations of the muscles during contraction of forty to fifty a second in different subjects. The study of these oscilla-

tions indicates a property of the activity of the neuro-muscular system and should have clinical application.

BIOLOGICAL CHEMISTRY.

(214) Growth of Guinea-Pigs.

ELEANOR M. HUME (*Biochemical Journal*, May, 1921) has made a study of the properties promoting growth in certain diets consisting of natural foodstuffs when these diets have been fed to guinea-pigs. In the course of the researches upon scurvy in guinea-pigs conducted at the Lister Institute, London, evidence has gradually accumulated which indicates that the healthy growth and maintenance of weight of guinea-pigs requires an abundant supply of the fat-soluble vitamin. This evidence is derived from two sources. In the first place, there are experiments in which guinea-pigs grew on one group of diets and failed to grow upon another group of diets. In general, those diets which promoted growth have seemed to agree in containing fat-soluble vitamin, while those which did not give rise to growth, have been lacking in it. Furthermore, those foodstuffs which produced partial growth, have done so apparently in proportion to their relative value in fat-soluble vitamin. In the early researches on scurvy the necessity for the addition of fat-soluble vitamin to the basal ration was not recognized. When the animals did not thrive, 60 c.cm. of milk, which had been heated in an autoclave to 120° C. for one hour, was added to the ration. With more experience, the amount of heated milk was increased to 90 c.cm. *per diem*. In the second place, histological examinations of the rib junctions of the experimental guinea-pigs have shown that bone lesions make their appearance in guinea-pigs fed on diets in which there is no possible suspicion that the ration is deficient in anti-scorbutic vitamin. The evidence derived from this line of investigation supports the conclusion that failure of growth and severity of the lesions in bone appear to be inversely proportional to the amount of fat-soluble vitamin in the diet. In these experiments young growing guinea-pigs, about 320 gm. in weight, have been fed with a mixture of oats and wheaten bran. To this ration weighed or measured amounts of the food to be tested have been added. These foods fall into two groups. The substances in the first group, including milk in several forms, green cabbage and hay, promote growth, whereas those in the second group, including white cabbage, swede juice, boiled onion, orange juice and germinated peas, do not promote growth. It was found that green cabbage was a satisfactory food, whether used raw or steamed, that the milk could be supplied raw, dried or heated without depriving it of its value and that boiling for an hour or more did not remove the quality from cabbage and milk. The author argues that the diets can only have been deficient in a factor of the rank of a vitamin and that the factor in these experiments which promotes growth, corresponds in its distribution with that of the fat-soluble vitamin. While a number of observers have made reference to the presence of lesions in the bones of guinea-pigs fed on diets in which there has been no deficiency of anti-scorbutic food accessory substances, there has not previously been any evidence that these changes are correlated with a deficiency of the fat-soluble vitamin. The author points out, in conclusion, that the guinea-pig will serve as a valuable laboratory animal in the examination of diets for the presence of fat-soluble A when these diets are unsuitable for rats. They will be of particular use in the case of foods which do not contain fats, many of which are not well adapted as foods for young rats.

(215) The Cause of Rickets.

HELEN M. M. MACKAY (*Biochemical Journal*, May, 1921) has fed kittens on a diet deficient in fat-soluble vitamin. As a result of experiments upon dogs, Mellanby has come to the conclusion that rickets is a dietetic disease and that the ultimate cause of rickets is a deficiency in the diet of an "anti-rachitic factor," a substance supposed to be identical with fat-soluble vitamin. Since the cat, like the dog and man, lives on a mixed dietary, it might be expected that kittens fed on a diet similar to the basal ration used by Mellanby would develope rickets. Two series of experiments have been completed. In the first series, kittens aged six weeks have been fed for three months on white bread, linseed oil, yeast and separated milk. A little orange juice has also been administered. The kittens have become emaciated and have ceased to grow. They have suffered from abdominal distension and from diarrhœa. At autopsy changes have been found in the costo-chondral junctions similar to those found in guinea-pigs and rats fed on a diet deficient in fat-soluble vitamin. No evidence of rickets has been observed *post mortem*. A second series of tests has been carried out on kittens sixteen days old. These kittens have been fed by hand with a similar ration. The appearance of these animals has been extremely like the clinical picture of cœliac disease in children. The condition has developed in about three weeks. At autopsy there has been found no evidence of rickets, but changes similar to those found in other animals fed with a ration deficient in fat-soluble vitamin A have been observed in the costo-chondral junctions. The histological changes have been studied by Miss F. M. Tozer, who finds that there is shortening of the bone trabeculæ, slight shortening in the rows of cartilage cells and varying degrees of atrophy of the marrow. The abnormalities do not, in her opinion, appear to resemble those characteristic of rickets, the only suggestion of resemblance between the two conditions being the possible length of the rows of cartilage cells.

(216) Acidity of Goat's Milk.

E. W. SCHULTZ AND L. R. CHANDLER (*Journal of Biological Chemistry*, March, 1921) have measured the hydrogen ion concentration of goat's milk, to ascertain the relation that the acidity of goat's milk bears to that of cow's milk and of human milk. They have employed the colorimetric method, with the indicators of Clark and Lubs. The accuracy of the standard solutions has been controlled and pyrex glassware has been used in all the tests. The samples of milk have been taken from the udder into a sterile flask. One cubic centimetre has been dialysed through a collodion sac against 2 c.cm. of neutral distilled water. Seven and a half minutes have been allowed for dialysis. The substitution of physiological saline solution for distilled water has not altered the results. The indicator has been added to the dialysate. The maximum acidity of soured goat's milk has been determined by taking the acidity each day until it became constant. In no case has a decrease in acidity taken place. From 160 estimations of fresh goat's milk, pH has ranged from 6.7 to 6.4. The average of 86 morning samples has been pH 6.52 and of 74 evening samples pH 6.54. The end points of 73 soured samples ranged from pH 4.4 to 3.7, with an average pH 3.92. As the acidity of cow's milk usually lies between pH 6.5 and 6.75 and of human milk between pH 6.8 and 7.4, fresh goat's milk is slightly more acid than cow's milk and appreciably more acid than human milk.

(217) Ingestion of Sodium Chloride.

W. DENNIS AND W. R. SISSON (*Journal of Biological Chemistry*, May, 1921) have made a series of experiments on the content of chlorides in milk after the ingestion of a definite amount of sodium chloride and upon a ration free from salt. The observations have been made on goats. The authors have been led to carry out these tests as a consequence of an extended series of determinations of chlorides in the milk of lactating women. The experiments have shown that the administration of a salt-free diet for a period of 24 days caused no change in the concentration of chlorides in the milk. The ingestion of 1.2 gm. of sodium chloride per kilogram of body weight for a period of six days did not increase the chlorides in the milk. When sodium chloride was given in sufficiently large amount to increase the chlorides in the blood plasma by one-sixth, the volume of milk became diminished to one-eighth in thirty hours and the chlorides in the milk were increased about six times. Toxic symptoms occurred after the administration of the large amounts; the goats became restless and exhibited tremors and spasticity of the extremities. In a few hours the goats could not stand. In one case it appeared as if the goat would die. The volume of milk fell from 750 c.cm. to 30 c.cm. in 24 hours.

British Medical Association News.

SCIENTIFIC.

A MEETING of the Victorian Branch of the British Medical Association was held in the Pathological Lecture Theatre of the Melbourne Hospital on August 3, 1921, MR. BASIL KILVINGTON, the President, in the chair.

Demodex (Owen).

DR. HERMAN LAWRENCE read a paper on "The Pathogenicity of *Demodex* (Owen) in the Human Body and of Other Parasites Producing Skin Diseases" (see page 419).

DR. A. NORMAN MCARTHUR supplemented the account given by Dr. Lawrence of the case of the patient referred to Dr. Lawrence by Dr. McArthur. This gentleman had become affected with an extremely troublesome pruritus shortly after acquiring and taking up residence in a new house. The itch had been intolerable at night-time, but less troublesome by day. The patient's habits were cleanly and he was completely at a loss to account for the "itch." It was noteworthy that while on a visit to Sydney he obtained relief, but the pruritus was re-established on his return home.

On one occasion he had noticed a covering or deposit on the sponge in the bathroom, which he attributed at first to aphis, which he assumed had blown in from some roses growing just outside the bathroom window. However, he had taken the sponge to Dr. Lawrence, who identified the particular acarus, *Dermanyssus*. Careful search then disclosed that these parasites had left a track on the wall paper in their passage down from a starling's nest above the ceiling.

Dr. McArthur emphatically denounced the starling as a denizen in the roofs and eaves of houses and congratulated Dr. Lawrence as being the first to investigate the starling as the host of the *Dermanyssus*. He understood that Dr. Lawrence held that these insects did not infest the birds themselves, but were to be found in their nests.

Enteric Fever.

DR. S. W. PATTERSON read a paper written by himself together with MISS F. E. WILLIAMS and DR. W. W. S. JOHNSTON, D.S.O., M.C., on "The Diagnosis of Enteric Fever and the Interpretation of Laboratory Reports" (see page 425).

DR. K. D. FAIRLEY read a paper on "The Treatment of Typhoid Fever by Intravenous Injections of Vaccines" (see page 428).

DR. KONRAD HILLER remarked that both these papers would repay an exhaustive and leisured study. Dr. Patterson's graphs had shown clearly that hæmoculture was the method of choice for laboratory diagnosis of enteric fever in the first week of the disease and that the agglutination reaction might be relied upon from the end of the second week.

Wit hreference to the paper of Dr. Fairley, Dr. Hiller said that he could testify to the effect of the vaccine given intravenously in alleviating the toxic features of enteric fever. It was indeed remarkable to see a very ill, toxic patient with dry tongue and marked apathy converted into a mentally alert individual, capable of reading a book. It was interesting to speculate as to why the injection of such a large amount of foreign bacterial protein should produce such a striking result; even if the temperature were unaffected, there was a distinct change for the better in the patient's condition. He wondered what effect was produced on the local lesions of the disease, the typhoid ulcers; but he was prepared to accept the intravenous injection of vaccine as a valuable addition to the measures available for the treatment of enteric fever.

DR. G. P. O'DAY asked if there were any parallel observations in the treatment of pneumonia and suggested that there might be scope for a similar method of ameliorating toxæmia in adynamic types of pneumonia. Dr. O'Day asked further whether Dr. Fairley had formed any conclusion on the specificity or otherwise of the response of the patients to typhoid vaccine.

DR. IVAN MAXWELL inquired if the asthmatic patient to whom reference had been made in Dr. Fairley's paper, had received any benefit from the intravenous injection of *Bacillus typhosus* and *Bacilli paratyphosi A et B* vaccine.

DR. N. HAMILTON FAIRLEY, O.B.E., said that he was aware that his brother had applied vaccine by intravenous injection in pneumonia, but the results had been indefinite. He had not observed any alleviation of toxic features and the febrile reactions which followed the vaccine in enteric fever, had been absent when a vaccine composed of strains of pneumococci representing the four types along with streptococci was injected intravenously.

With reference to the manner in which the results were brought about, investigations set out in the paper had shown that there was serological evidence of increased antibody formation, but it was also mentioned that Kraus had claimed to have obtained similar results in a non-specific manner with emulsions of *Bacillus coli*. For the present they were maintaining an open mind upon the point. The clinical results in the patient to whom the intravenous injection of typhoid-paratyphoid A and B vaccine had been given, were excellent. The paroxysm ceased within twenty-four hours and for the ensuing nine weeks there had been complete freedom from further attack. In the preceding eight years the patient had suffered from recurring attacks at intervals of three weeks; the longest interval during this period was six weeks.

TRANSACTIONS OF THE COUNCIL OF THE VICTORIAN BRANCH.

THE following is a summary of the more important transactions of the Council of the Victorian Branch during the month of October:

Dinner to Dr. Todd.

The Council entertained Dr. R. H. Todd at dinner at the Grand Hotel on October 13, 1921. Dr. Todd, who was returning to New South Wales from his successful mission to England, explained the steps taken to secure autonomy for the overseas Branches, whereby the members could still retain their membership of the British Medical Association.

Rebate of Subscription.

A letter was read from the Medical Secretary of the British Medical Association to the effect that the rebate for the year would be 6s. instead of 4s. as heretofore. The credit of the Branch was thus increased by nearly £100.

Election by Divisions.

The ballot for a representative of the North Suburban Division on the Council for 1922 resulted in a tie. The Council ordered a re-election of the two at the head of the poll and Dr. W. F. Brownell was successful.

Dr. B. M. Sutherland was elected for the Western Suburban Division.

Private Hospital Regulations.

Under Section 7 (*f*) of the Regulations attached to the *Private Hospitals Act* it is compulsory for the proprietor of a private hospital to keep a case book in which the clinical history of the patient is recorded.

A deputation of the Council waited upon the Public Health Department, when it was agreed that such clause would not be enforced, that each private hospital would be notified that the clause need not be complied with and that subsequently the regulation would be amended in that regard.

Bush Nursing.

A resolution was passed that it was advisable for members to act on the local council of the Bush Nursing Association. The members were informed of the resolution, as was also the central executive of the Bush Nursing Association.

War Memorial.

It was reported that there was £455 in hand for the war memorial, £100 had already been paid to Mr. Web. Gilbert, the sculptor, and that a further sum of £45 was required. This memorial will be erected to those who fell in the Great War and it was decided that none of the money raised should be expended on a record of those who

had served in any capacity in the war, as had been suggested to the Council.

New Buildings.

The project for obtaining new buildings for the Victorian Branch was advanced a step. The Council passed a resolution:

> The Council considers the time is ripe for removal to a more central position and into buildings more suited to the requirements of the Victorian Branch of the British Medical Association.

It approved of a scheme for the purchase of a site in Collins Street and the sub-committee was empowered to take steps to see if the amount required could be raised by debentures.

Coroner's Act, 1915.

A complaint was received from a country member, which stated that, under Clause 29 (*b*) of the *Coroner's Act* mileage was only allowed if over ten miles from the surgeon's residence and then only 1s. per mile one way. A deputation of the three parliamentary representatives waited on the Attorney-General, who, in a letter to Dr. Harris, pointed out that a mistake had been made, as the *Coroner's Act* was obsolete and that mileage was paid under the *Appropriation Act*. Division 43, Subdivision 1, at the rate of 1s. per mile from usual place of abode to place of intended inquest or inquiry, one way only, subject to the payment of special fees in exceptional cases under the authority of the Minister. It was also shown from the correspondence that if an external examination only of the body were made, nothing would be paid; there must be an examination by dissection. So that if a medical practitioned travelled forty miles, there and back, and viewed the body only, he would receive 20s. under the "more liberal basis" of the *Appropriation Act* for mileage only.

Salaries of Health Officers.

To inquiries by the Council, 89 replies were received from Shires and 129 replies from Medical Health Officers. Increases of salaries had been made in 29 instances, but out of 190 shires only 25 pay the rate recommended by the Health Commission. A letter was sent to the Health Commission, asking it to take steps to enforce its recommendation and attention was drawn to the anomaly at Ballaarat, where there was an amalgamation of the two offices of City and Shire and a salary of £75 was advertised. Though the retiring Health Officers protested against the amount offered, which should be £350, from local circumstances they were compelled to apply for the position.

Library.

A large number of copies of the *Journal of the American Medical Association* and of *Surgery, Gynecology and Obstetrics* was presented to the Council by Dr. R. H. Fetherston and by Dr. J. Newman Morris. Volumes were also presented by Dr. A. W. Finch Noyes.

Society for Fighting Venereal Diseases.

The Council was invited to elect six representatives on the Council of the Society for Fighting Venereal Diseases. The matter was left to the incoming Council at its first meeting in December.

Australasian College of Dentistry Alumni Society.

A request for a conference between the Council of the Australasian College of Dentistry Alumni Society and that of the Victorian Branch was acceded to. It was desired that there should be a discussion of the question of the closer co-operation of the medical and dental professions in regard to focal infection.

Salaries of Medical Sub-Professorial Staff.

The Council of the University of Melbourne sent a reply that it was impossible to reconsider the salaries of the medical members of the sub-professorial staff.

Midwives Board.

A medical practitioner has sometimes found himself called to a case at which the nurse attending is not registered under the *Midwives Act*. The question of liability of the medical practitioner then arises. A question was framed for the Midwives Board and a reply received that the nurse attending would be liable to fine under the Act, but no provision is made under the Act for the action of a medical man attending under such a condition.

Resignation.

The resignation of Dr. R. E. Shuter, who had given up practice, was accepted with regret.

NOMINATIONS AND ELECTIONS.

THE undermentioned have been nominated for election as members of the New South Wales Branch of the British Medical Association:

FURBER, THOMAS MAYNARD, M.B., 1911 (Univ. Sydney), 16 Stanmore Road, Marrickville.

GAHA, JOHN FRANCIS, M.B., Bac. Surg., 1919 Nat. Univ. Irel.), M.R.C.S. (Eng.), L.R.C.P., 1919 (Lond.), D.P.H. (Trin. Coll. Dubl.), "Omapere," Lane Cove Road, St. Leonards.

LANGDON, JOHN FREDERICK BRITON, M.B., 1919, Mast. Surg., 1920 (Univ. Sydney), "Tresillian," Cronulla.

THE undermentioned has been elected a member of the South Australian Branch of the British Medical Association:

CARDEN, WILFRED HALLOW WILLIAM CONDELL, L.R.C.P. *et* L.M., Ireland, 1914; F.R.C.S., Ireland, 1919, Bute.

THE undermentioned have been elected members of the Victorian Branch of the British Medical Association:

ANDERSON, ESME VIVIENNE, M.B., B.S., 1921 (Univ. Melb.), Auburn.

BODY, JOHN HERBERT, M.B., B.S., 1921 (Univ. Melb.), Fitzroy.

BUNTINE, RICHARD MURRAY, M.B., B.S., 1921 (Univ. Melb.), East St. Kilda.

STAHLE, ELLEN IRENE, M.B., B.S., 1921 (Univ. Melb.), Hawthorn.

THE WAR MEMORIAL FUND IN VICTORIA.

THE following have contributed to the War Memorial Fund of the Victorian Branch of the British Medical Association: A. G. Black, C. A. Courtney, S. O. Cowen, C. Dinwoodie, P. H. Liddle, R. J. Loosli, Val. Macdonald, W. Colin Mackenzie, W. F. Orr, R. F. O'Sullivan, David Rosenberg, H. P. Sloggett, R. N. Wawn.

Public Health.

THE PLAGUE OUTBREAK.

BULLETIN No. 12 has been issued by the Federal Department of Health on November 2, 1921.

General.

Instructions have been issued to the Quarantine Officers to deal with overseas vessels only in the manner prescribed in Order No. 16. These provisions are in accordance with the international agreements concerning quarantine. In regard to inter-State vessels, it has been determined that if a person is found to be suffering from plague on board, the vessel is to be ordered into quarantine. If it be established that the person had probably been infected on land and not on the vessel, the infected person is to be isolated and no further measures are to be adopted in regard to the vessel beyond those prescribed for all vessels from Queensland ports. The passengers and crew are to be kept under surveillance for seven days subsequent to the removal of the patient. If it be found that the infection was contracted on board, the vessel is to be ordered into quarantine.

Plague in Human Beings.

It is reported from Queensland that a man, aged 49 years, residing on Kangaroo Point and employed in George Street,

Brisbane, was taken ill on October 22, 1921. The patient was isolated on October 28, 1921, as soon as the bacteriological examination proved the infection to be plague. On October 30 another patient was admitted to the Wattlebrae Isolation Hospital with the diagnosis of suspected plague. The diagnosis was confirmed on November 1, when a further infection in a human being was notified. On the same day a man from Musgrave Street, West End, Brisbane, was also admitted to the Isolation Hospital.

In Townsville two cases of plague, both in Chinese, were reported on October 29, 1921. Both infections ended fatally and the diagnosis was confirmed *post mortem*. On November 2 the State Commissioner of Health reported a further case of plague in a Chinese. The man died on October 31, 1921.

It was reported on November 1, 1921, that a man in Innisfail was suffering from bubonic plague.

Plague in Rodents.

From October 27 to October 31, 1921, 1,174 rats, 89 mice and six cats were examined in Brisbane. Of these animals seven rats and one mouse were found to be infected.

From Townsville smears of fifteen rats were sent on October 29, 1921, to the Laboratory of the Department. *Bacilli pestis* were discovered in five of the smears. Of eight rats examined at the Townsville Institute of Tropical Medicine on October 31, 1921, one proved to be infected with plague.

The Hinchinbrook Shire Council forwarded on October 31, 1921, smears from 54 rats to the Health Department. One of these rats was infected.

The Department of Public Health of New South Wales reported that 318 rats and 21 mice had been examined on October 28, 29 and 31, 1921. The City Council reported that 554 rats had been examined on October 27, 28 and 29. None of these rodents was infected. On the other hand, of 216 rats and nine mice examined by the Health Department on November 1, 1921, two from a produce store in Sussex Street, Sydney, were found to be infected.

No infected rats were discovered in Western Australia or Tasmania, although many were examined.

The passengers from the *Kuranda* were released under quarantine surveillance as soon as it was discovered that there was no evidence that the source of infection was situated within the vessel. After the final fumigation one rat was found dead in a lifeboat. It was not infected.

Naval and Military.

APPOINTMENTS.

THE following announcements appear in the *Commonwealth of Australia Gazette*, No. 82, of October 27, 1921:

FIRST MILITARY DISTRICT.

Australian Army Medical Corps.

CAPTAIN R. O. DOUGLAS is transferred to the Unattached List, 27th August, 1921.

SECOND MILITARY DISTRICT.

Australian Army Medical Corps.

CAPTAIN R. A. FOX is transferred to the Reserve of Officers, 1st September, 1921.

CAPTAIN F. W. KANE is transferred to the Reserve of Officers, 1st October, 1921.

THIRD MILITARY DISTRICT.

Australian Army Medical Corps.

CAPTAIN A. P. DRUMMOND is transferred to the Reserve of Officers and to be Major, 1st October, 1921.

Australian Army Medical Corps Reserve.

THE resignation of HONORARY MAJOR J. H. L. CUMPSTON of his commission is accepted, 14th May, 1921.

FOURTH MILITARY DISTRICT.

Reserve of Officers.

CAPTAIN J. A. LOVE is transferred from the Reserve of Officers, Sixth Military District, 1st September, 1921.

SIXTH MILITARY DISTRICT.

Reserve of Officers.

CAPTAIN J. A. LOVE is transferred to the Reserve of Officers, Fourth Military District, 1st September, 1921.

THE ANDERSON STUART RESEARCH FELLOWSHIP MEMORIAL.

THE COMMITTEE OF THE ANDERSON STUART RESEARCH FELLOWSHIP MEMORIAL is appealing for funds for the purpose of endowing a research fellowship. The following is the first list of subscribers. The Committee will publish further lists from time to time. The subject of this fund is discussed on another page of this issue.

	£	s.	d.
University of Sydney Medical Society (per J. G. Wagner)	139	3	7
Professor H. G. Chapman	100	0	0
Dr. R. Gordon Craig	100	0	0
Sir Benjamin Fuller	100	0	0
Anthony Hordern & Sons, Limited	100	0	0
Professor A. E. Mills	100	0	0
Dr. John Morton	100	0	0
Professor J. T. Wilson	100	0	0
Dr. Fourness Barrington	50	0	0
Dr. F. A. Bennet	21	0	0
Professor J. I. Hunter	21	0	0
Dr. H. H. Schlink	21	0	0
Dr. R. H. Todd	20	0	0
Dr. H. J. Clayton	10	10	0
Dr. B. Coen	10	10	0
Dr. H. R. G. Poate	10	10	0
Sir James Burns	10	0	0
F. D. Kent, Esq.	10	0	0
Dr. R. Fairfax Reading	10	0	0
Anonymous	5	15	0
Sir Henry Y. Braddon	5	5	0
Dr. W. F. Litchfield	5	5	0
Dr. A. H. Tebbutt	5	5	0
Dr. H. Anderson	5	0	0
Dr. W. M. A. Fletcher	3	3	0
Dr. John Macpherson	3	3	0
Dr. R. Dick	2	2	0
Professor Charles Fawsitt	2	2	0
Dr. R. Francis	2	2	0
Dr. Sydney George	2	2	0
Dr. A. J. Gibson	2	2	0
Dr. W. E. Harris	2	2	0
Dr. H. E. Lee	2	2	0
Drs. J. and A. J. Mackenzie	2	2	0
Dr. R. J. Silverton	2	2	0
Dr. Bevan W. Neave	2	2	0
Dr. Donald Smith (Perth)	2	2	0
Dr. F. S. Stucky	2	2	0
Dr. Harold Thomas	2	2	0
Dr. Elliott True	2	2	0
Dr. N. W. Kater	2	0	0
Dr. K. S. McArthur Browne	1	1	0
Dr. Mary B. Burfitt	1	1	0
Leo. A. Cotton, Esq. (Geology Department)	1	1	0
Dr. W. M. Helsham	1	1	0
Dr. Dudley Henry	1	1	0
Dr. G. E. Hobson	1	1	0
A. J. Kilgour, Esq.	1	1	0
Dr. F. W. Liggins	1	1	0
Dr. M. O'Reilly	1	1	0
Dr. C. V. Single	1	1	0
Dr. H. G. H. Wardlaw	1	1	0
Dr. J. Coleman Woods	1	1	0
Dr. R. Worrall	1	1	0
Dr. O. Latham	1	0	0
Dr. A. N. Burkitt	0	10	6
Total of donations and promises	£1,113	1	1

The joint Honorary Secretaries are SIR HERBERT MAITLAND, 147, Macquarie Street, Sydney, and DR. CECIL PURSER, 193, Macquarie Street, Sydney.

Obituary.

PETER JOHNSTON FREYER.

THE news from London of the death of Peter Freyer will be received with sincere regret by many. His eminence in that branch of surgical practice which is concerned with the urinary organs, was built up on assiduous study, critical judgement and profound knowledge. Freyer was possessed of the ready tongue, wit and charm of his countrymen. He was born in Galway seventy years ago. His student career at the Royal University of Ireland was a brilliant one and gave promise of achievements in his professional life. Nine years after graduation he entered the Indian Medical Service and for twenty years he worked in the North-West Provinces of India and attained considerable distinction, both in military and in civil circles. After his retirement he returned to England and immediately devoted himself to urological surgery. His pioneering attainments in connexion with lithopaxy and more especially with the operation for the enucleation of the prostate through the bladder opened from above, have had an incalculable influence on the surgical treatment of diseases of the urinary organs. Peter Freyer's association with St. Peter's Hospital for Stone in Golden Square, London, has coincided with the development of the science and practice of urology in Great Britain. His technical skill, his ingenuity and his sound knowledge of anatomy and physiology had scope and resulted in a remarkable advance in this branch of surgery. He was created a Commander of the Bath early in 1917 and received the honour of knighthood six months later. During his professional life he received numerous marks of recognition of the importance of his work, not only in the United Kingdom, but also in several foreign countries. The Royal Society of Medicine placed him at the head of his class, by selecting him to be the first President of the Section of Urology, which was formed in 1920. His influence on the teaching of urology in the British Empire will be long lived.

DR. ROBERT J. SILVERTON writes:

To one who was recently associated with Sir Peter Freyer as his house surgeon, the news of his death comes as a shock, for one had not to be very long in the company of this eminent pioneer in urology to fall subject to the delightful charm as well as the force of his personality and so affection for him was quickly engendered.

I am informed that his death came as a surprise to all his friends, for he was about to return to active duties after a few months' well-earned holiday when he was taken acutely ill and died of heart failure within a few hours.

As a teacher Freyer's influence was restricted mainly to the subjects of suprapubic prostatectomy and litholapaxy. Of the latter he often said: "This is not surgery, but a mechanical art"; and very beautiful were his performances in this important branch of manipulative surgery. Of the former operation he was probably the actual originator and certainly the first doughty champion. Some of his colleagues in London were his bitterest opponents during his early advocacy of this remarkably successful operation and his determination to stand fast by his convictions in the face of strong opposition is the brightest point of his career. Though his interests in the domain of urology were thus restricted, he was keenly alive during recent years to the brilliant advances made in all parts of this specialty. In 1920 he was made the first President of the new-born Section of Urology at the Royal Society of Medicine. I recall with pleasure his excellent address at that meeting and the generosity he displayed in paying full tribute of praise to the work of the more modern urologists around him.

His work has been largely responsible for the firm establishment of the operations of suprapubic prostatectomy and litholapaxy, the latter certainly amongst urologists and the former among all surgeons practically the whole world over. It is hoped in London that, to perpetuate his memory, a Freyer memorial will be established to enlarge and modernize St. Peter's Hospital, the home of urology in England.

GORDON JOHN KENNEDY McIVER.

THE death of Gordon McIver on October 5, 1921, after a brief illness, occasioned a great shock to a wide circle of friends in the medical profession in Victoria.

Gordon John Kennedy McIver was the son of the late Evander McIver, architect, and was born at Royal Park, Melbourne, on March 10, 1890. He was educated at the Melbourne Church of England Grammar School and throughout his school career enjoyed a well-merited popularity based on his genial and lovable disposition.

Gordon McIver entered on his medical studies at the University of Melbourne in 1910. Graduating in 1916, he promptly answered the call for medical officers in the Australian Imperial Force and was attached to the Fourteenth Field Ambulance. Subsequently he carried out the hazardous duties of regimental medical officer to the Fifty-Eighth Battalion and a severe "gassing" in the course of service with this unit necessitated his being invalided home from France in 1918.

After his return from service abroad Gordon McIver was appointed a resident medical officer at the Alfred Hospital, a position he relinquished in order to commence practice in Box Hill. In October, 1920, he married Miss Beryl Kelly, only daughter of C. Bonage Kelly, Esq., of "Ellsmere," Princess Street, Kew, and had been in practice only two years when his untimely death supervened on a rapidly progressive pneumonia.

During the two years in which he was engaged in private practice, Gordon McIver held the appointment of medical clinical assistant in the Out-Patient Department of the Melbourne Hospital. His chief extra-professional interest was in mechanical engineering, in the pursuit of which as a hobby he took a keen delight and exhibited a high degree of skill.

DR. S. O. COWEN writes:

Gordon McIver's death has caused not only deep regret, but a sense of personal loss amongst his contemporaries. Both at school and at the University his cheerful and kindly nature impressed all those with whom he came into contact. His good temper was unfailing and he was generous to a fault. During our fifteen years' friendship I never knew him make an unfair or even unfriendly criticism of any of his fellows. These qualities not only earned for him great popularity, but also inspired a warm feeling of affectionate friendship for him amongst the men of his year.

Correspondence.

A PERSONAL MATTER.

SIR: I ask you to give this letter the same prominence you gave to your own comments on the Farr case and your personal criticism of myself at a time when the matter was still *sub judice*.

Fellow members: The Council of the New South Wales Branch of the British Medical Association, having resolved on my expulsion, ask you to confirm that expulsion at a general meeting to be held on the 18th inst.. It has been decided by the Council that I have held the profession up to public contempt. Permit me, in the first place, to point out that Mrs. Farr is now a free woman, an application for her committal to an asylum in New Zealand having been refused. Had she really been suffering for nine years from severe *folie circulaire*, as alleged, she would now be manifestly demented and her recovery impossible. My action in her case has therefore been vindicated.

In pursuing what I regarded as my duty, I necessarily came into conflict with those who took another view of the

case and who, it seems to me, have not scrupled to take action against me. The ease with which an association falls into the control of a clique is well known and I now appeal from the Council to members in general. I am accused of actions derogatory to the profession and calculated to hold it up to public contempt. I make no appeal on personal grounds, but ask members to carefully consider whether the expulsion of any member, on merely technical grounds or on truthful statements made during an honest endeavour to right what he believed to be a gross injustice, is calculated to raise the profession in the esteem of the general public. Would not such expulsion be calculated to create contempt in the mind of every just and reasonable man?

Yours, etc.,

G. S. THOMPSON.

229 Macquarie Street, Sydney,
November 1, 1921.

W. WATSON & SONS, LIMITED.

SIR: May we take the liberty of reminding those of your readers who are thinking of applying for shares in our company (new issue of 10% cumulative preference £1 shares), which you were good enough to refer to in your issue of October 15, 1921, that the application list will close on November 22, 1921.

A large number of shares have been already applied for and we anticipate that the full number, fifteen thousand, will be subscribed by that date.

Yours, etc.,

W. WATSON & SONS, LIMITED.

15, Castlereagh Street, Sydney,
November 2, 1921.

Books Received.

A TEXT-BOOK OF SPECIAL PATHOLOGY, FOR THE USE OF STUDENTS AND PRACTITIONERS, by J. Martin Beattie, M.A. (N.Z.), M.D. (Edin.), M.R.C.S., L.R.C.P. (Lond.), and W. E. Carnegie Dickson, M.B., B.Sc., F.R.C.P. (Edin.): Second Edition, 1921. London: William Heinemann (Medical Books), Limited; Royal 8vo., pp. 1,084, with 267 illustrations in the text and four coloured plates from original preparations. Price: 31s. 6d. net.

Medical Appointments.

DR. E. SIROIS (B.M.A.) has been appointed Government Medical Officer at Marburg, Queensland.

* * * *

DR. C. SHELMERDINE (B.M.A.) has been appointed Medical Officer of Health by the Merredin (Western Australia) Road Board.

* * * *

DR. A. W. GORDON (B.M.A.) AND DR. THALIA E. ROCHE have been appointed Certifying Medical Practitioners under the *Workers' Compensation Act, 1915*, at Essendon and Dromana, Victoria, respectively.

* * * *

DR. H. N. MORTENSEN (B.M.A.) has been appointed Medical Referee under the *Workers' Compensation Act, 1915*, at Yarrawonga, Victoria.

Medical Appointments Vacant, etc.

FOR announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xx.

PERTH HOSPITAL, WESTERN AUSTRALIA: Chief Resident Medical Officer.

UNIVERSITY OF ADELAIDE: Lecturers and Demonstrators in the Medical School.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429, Strand, London, W.C.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney	Australian Natives' Association Ashfield and District Friendly Societies' Dispensary Balmain United Friendly Societies' Dispensary Friendly Society Lodges at Casino Leichhardt and Petersham Dispensary Manchester Unity Oddfellows' Medical Institute, Elizabeth Street, Sydney Marrickville United Friendly Societies' Dispensary North Sydney United Friendly Societies People's Prudential Benefit Society Phœnix Mutual Provident Society
VICTORIA: Honorary Secretary, Medical Society Hall, East Melbourne	All Institutes or Medical Dispensaries Australian Prudential Association Proprietary, Limited Manchester Unity Independent Order of Oddfellows Mutual National Provident Club National Provident Association
QUEENSLAND: Honorary Secretary, B. M. A. Building, Adelaide Street, Brisbane	Brisbane United Friendly Society Institute Stannary Hills Hospital
SOUTH AUSTRALIA: Honorary Secretary, 3, North Terrace, Adelaide	Contract Practice Appointments at Renmark Contract Practice Appointments in South Australia
WESTERN AUSTRALIA: Honorary Secretary, 6, Bank of New South Wales Chambers, St. George's Terrace, Perth	All Contract Practice Appointments in Western Australia
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington	Friendly Society Lodges, Wellington, New Zealand

Diary for the Month.

Nov. 15.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
Nov. 15.—Illawarra Suburbs Medical Association (N.S.W.).
Nov. 16.—Western Australian Branch, B.M.A..
Nov. 18.—Eastern Suburbs Medical Association (Sydney).
Nov. 18.—North-Eastern Medical Association (N.S.W.).
Nov. 22.—New South Wales Branch, B.M.A.: Medical Politics Committee; Organization and Science Committee.
Nov. 24.—South Australian Branch, B.M.A..
Nov. 25.—New South Wales Branch, B.M.A..
Nov. 25.—Queensland Branch, B.M.A.: Council.
Nov. 29.—Victorian Branch, B.M.A.: Ballot Papers Issued for Election of Office-Bearers.
Nov. 30.—Victorian Branch, B.M.A.: Council.
Dec. 6.—Victorian Branch, B.M.A.: Ballot Papers for Election of Office-Bearers returned.
Dec. 6.—New South Wales Branch, B.M.A.: Ethics Committee.
Dec. 7.—Victorian Branch, B.M.A.: Annual Meeting.
Dec. 8.—Brisbane Hospital Clinical Society.
Dec. 9.—Queensland Branch, B.M.A.: Annual Meeting.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned.

Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, B.M.A. Building, 30-34, Elizabeth Street, Sydney. (Telephone: B. 4635.)